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Relief Fund for the Forestry Regiments..... 643

Foresters in World's Largest Regiment..... 644
With fifteen illustrations.

American Foresters in Military Service.....652

Forestry at Bates College.....655

Tree's Long Journey on Truck..... 655
With one illustration.

The Pine—By Mabel Powers (Yeh sen noh wehs—One Who Tells the Stories)..... 656
With one illustration.

"Doctor Mountain"—By Mark Daniels..... 657
With Seven Illustrations.

The Nuthatches and the Chickadees—By A. A. Allen.....663
With eleven illustrations.

A Trail Marker—By Lena B. Hunzicker..... 667
With one illustration.

A Quaint Bit of Sentiment—By Gayne T. K. Norton..... 668
With one illustration.

Flowers, Feathers and Fins—By R. W. Shufeldt..... 669
With twelve illustrations.

Women Help to Fight Forest Fires..... 674
With three photographs.

Conservation in Autumn Leaves..... 675

Tree Saved by a Governor—By Allen H. Wright..... 675
With one illustration.

Urban and Suburban Food Production—Its Past and its Future—By Charles Lathrop Pack..... 676

Forestry for Boys and Girls—"Shoes and Ships and Sealing Wax"—By Bristow Adams..... 678

Children's Playgrounds in Parks and Forests—By Smith Riley 680
With six illustrations.

Hybrid Oaks—By George B. Sudworth..... 683
With five illustrations.

A Tree That Produces Soap..... 686
With one illustration.

Edible Fruits of Forest Trees..... 687

Fighting the Pine Blister Disease..... 688

Our Forest Resources and the War—By E. A. Sterling..... 689

Editorial 691
Forestry as a Profession for Young Men in the United States.

Bad Forest Fire Season..... 692

How a Successful Suburban House is Built—By Rawson W. Haddon 693
With four illustrations.

Book Reviews..... 695

Canadian Department..... 697

Current Literature..... 699

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AMERICAN FORESTRY

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RELIEF FUND FOR THE FORESTRY REGIMENTS

TO meet the needs of individual members of the American Forest Regiments in France and their dependent families, it is essential that prompt response be made to the financial requirements of the Lumber and Forest Regiments' Relief Fund. The American Forestry Association, in making earnest appeal to its members and its friends for contributions for this splendid cause, does so with an assurance and confidence based on the intimate relationship which exists between forest lovers and the men who are risking their lives in the French war zone for the sake of the American flag.

In a peculiar sense this Association has deep interest and responsibility in the success of the fund. The plan for relief for the men of the Forest Regiments found its inception within the Association. Conceived as the American Forestry Relief and Comfort Fund, the project found rapid expansion until it was deemed desirable to broaden its scope and influence as indicated by the name with which it has been rechristened, the Lumber and Forest Regiments' Relief Fund. In this form and under its present scheme of organization it co-ordinates the forces of various interests affiliated with forestry, lumbering and kindred industries. These allied influences are equally impressed with the vital importance of the undertaking and equally concerned with its successful achievement.

The need for a fund of this nature speaks for itself. With the 10th Engineers (Forest) already in France, and with the 20th Engineers (Forest) preparing to enter the service, the United States will have more than 9,000 foresters and woodsmen in the French forests. These men go oversea for a purpose in no degree less vital to military success than that which takes our trench fighters and other armed forces into the foreign zone of battle. Without the Forest regiments the fighters would be of little avail. These men have not gone to France to serve personal ambition or to pursue any fanciful occupation of doubtful worth. They are there because of the urgent needs of the Allied armies for trench timbers and other building material requisite to modern warfare. These needs are universally recognized by the army leaders of the Allied nations. It is at the insistent demand of these leaders that the regiments have been ordered to the war zone.

In their voluntary enlistment in the Forest Regiment thousands of red-blooded Americans have answered the call of duty at great personal cost. The regiments are made up of foresters, practical lumbermen and sawmill operators, men of engineering or military training, picked woodsmen, sawmill workers, skilled axmen, woodsawyers, crosscut-saw filers, tie-hewers, skidders, teamsters, blacksmiths, millwrights, mill sawyers, circular-saw filers, millhands, carpenters, machinists, charcoal burners, motor truck and motorcycle operators and repair men. These men are all trained workers. As such they are capable of commanding high wages in their daily work. In the service of their country privates in foreign service draw monthly pay ranging from $33 to $36.60 each. It involves no task in figures to realize the sacrifice these men make in accepting the pay of private soldiers at a time when home wages are higher than at any time in the history of the world; and it requires no flight of the fancy to realize that the pay given them for their work in the French forests will be sadly deficient for the needs of such families as may be left behind.

It is in recognition of this condition that the relief fund is created. That many of the men should leave their families illy prepared to provide for themselves is inevitable. This circumstance makes it imperative that generous help should be swiftly given, to the end that no suffering or hardship which could be prevented is permitted to exist. The logical source of such helpfulness is with the people of America who are interested in these men through the kinship arising from mutual interest in the woodland and lumber resources of the country. Those whose interest in the forests is sentimental have common cause with those who are concerned with the economic wealth of the timberlands. Whether one's love for the trees is based on the lure of the great outdoors or whether it is purely commercial, the sacrifices of the men of the woods and lumber camp must necessarily make direct appeal. The cause is as broad as humanity; the results will be both human and practical.

As a part of the work a committee of women has been organized by Mrs. Henry S. Graves, wife of United States Forester Graves, who is now Lieutenant Colonel in charge of forest work with the United States Expeditionary Forces. This committee will assume the duty of providing sweaters and other knitted garments for the men of the Forest Regiments. Shortly letters will be sent to women of America known to be interested in forestry, requesting co-operation in the knitting of these garments. Wool will be furnished at cost to those workers who prefer to pay for it and, as far as possible, without charge to those who prefer to give their time only.

Contributions for the Lumber and Forest Regiments' Relief Fund should be sent to the American Forestry Association, Maryland Building, Washington, D. C.

FORESTERS IN WORLD'S LARGEST REGIMENT

AS the largest regiment in the world the 20th Engineers (Forest) will command the respect of Allies and enemy alike. This regiment is now in advanced stages of organization. Its ten battalions of foresters, woodsmen and lumbermen will have a strength of 7,500 enlisted men. In addition there will be nine service battalions with a strength of 7,250 enlisted men. The men in the service battalions will be laborers, for use in connection with the operations of the regiment. The total strength of the regiment will approximate 17,000 officers and men, which will establish a new record for military formation. It was announced early in November that two battalions of 750 men each were completely organized and would proceed to France at once. Two more battalions were to be organized immediately and the others will follow in close succession until the entire strength is in the French forests.

Col. W. A. Mitchell is commander of the regiment. He is a native of Georgia and a regular army man, who graduated from West Point with first honors. Colonel Mitchell has been in command at the encampment at the American University, District of Columbia, where the organization of the regiment has been taking place. Officers at regimental headquarters are:

Regimental surgeon, Major W. C. Moore, National Army, Virginia, graduate of the University of Virginia; regimental adjutant, Capt. H. L. Bowlby, National Army, Oregon, West Point graduate and State Highway Engineer for Oregon; regimental Engineer officer, Captain F. M. Bartelme, National Army, Minnesota, president of the Bartelme (Lumber) Company, Minneapolis; regimental supply officer, Captain P. E. Hinkley, National Army, Maine, assistant general manager of S. D. Warren & Company, Boston, Massachusetts.

COL. W. A. MITCHELL, U. S. A., COMMANDING 20TH ENGINEERS (FOREST).

For the First Battalion the officers are as follows:

Major E. E. Hartwick, president Hartwick Lumber Company, Detroit, Michigan, first vice-president Guaranty Trust Company, Detroit.

Captains: Leon M. Pill, division engineer Mobile & Ohio R. R., Mobile, Alabama; Harry V. Campbell, engineer officer, sawmill owner and operator; Arthur W. Elam, president A. W. Elam Company, logging engineers, San Francisco, California; Andrew J. Fisk, consulting civil and mining engineer and general contractor, Montana; H. W. Bostzkes, district engineer, Washington State Highway Department.

First Lieutenants: L. J. Freedman, supply officer, pulpwood buyer and contractor for International Paper Company; Germain P. Graham, consulting municipal engineer, Albany, New York; J. C. Williams, Jr., assistant general manager, Geneva Lumber Company, Eleanor, Florida; Duncan P. Shaw, sawmill owner and operator, North Carolina; Harold C. Lyons, consulting efficiency engineer, New York City; William A. Clark, manager Walter D. Noyes Lumber Company, Boston, Massachusetts; T. W. Poindexter, municipal engineer, New York State; R. N. Benjamin, director of vocational training, Fitzgerald High School, Fitzgerald, Georgia; W. J. Wilson, district engineer, port of Seattle, Seattle, Washington; J. L. Wood, sawmill operator.

Second Lieutenants: John B. Cuno, forester, West Virginia; R. L. Chaffin, consulting engineer, West Palm Beach, Florida; Arthur N. Drips, efficiency engineer for lumber industry, Western Washington; L. B. McDaniel, district manager for lumber interests, Georgia; Hollister Johnson, junior engineer, New York State Conservation Commission; H. T. Hopkins, wholesale and retail dealer in finished pine lumber, Hortsville, South Carolina.

For the Second Battalion the officers are as follows:

Major S. O. Johnson, vice-president Weed Lumber Company, Weed, California.

Captains: F. F. Spencer, assistant to the president of the McCloud River Lumber Company, McCloud, North Carolina; F. A. Horstkotte, master mill builder and inventor of sawmill machinery, formerly connected with W. A. Wilkinson; W. V. Brookings, vice-president of the California-Oregon Lumber Company; J. C. Perry, connected with the Diamond Match Company, the McCloud River Lumber Company and the Weed Lumber Company; J. C. Long, civil engineer, connected with the Milwaukee Lumber Company.

First Lieutenants: M. R. Ethell, civil engineer, with general engineer experience; E. D. Woodruff, civil engineer, with experience in timber work and general engineering work, a brother of Col. James A. Woodruff, of the 10th Engineers (Forest); W. O. Crosby, superintendent of the mills of the Holmes Lumber Company, of Oregon; Marion Nine, owner and operator of sawmills and president of the Nine Lumber Company; Frank R. Prince, assistant manager of the Shevlin Hickson Company; P. D. Mackie, civil engineer, with five years' experience in shingle mills in Washington; W. H. Crosson, civil engineer, with special experience in bridge building; R. W. Pilling, general superintendent of the Rogers Lumber Company; L. R. McCoy, assistant manager of the Edward Rutledge Timber Company; W. E. Volk, civil engineer, with railroad experience on the Pacific Coast and in Alaska and Panama.

Second Lieutenants: M. L. Johnson, assistant engineer with the Weed Lumber Company, Weed, California; E. S. Brush, thoroughly versed in lumber operations, connected with the Loop Lumber Company; W. H. Grover, assistant engineer with the Fruit Growers' Supply Company, on the Pacific Coast.

Since the first American Foresters went to France several important changes have taken place in the personnel. The Forest Service has received word that United States Forester Henry S. Graves has been promoted to lieutenant colonel. Forester Graves was one of

CAPT H. L. BOWLBY, REGIMENTAL ADJUTANT, 20TH ENGINEERS (FOREST).

CAPT. F. M. BARTELME, REGIMENTAL ENGINEER OFFICER, 20TH ENGINEERS (FOREST)

CAPT. P. E. HINKLEY, REGIMENTAL SUPPLY OFFICER, 20TH ENGINEERS (FOREST).

the first Americans to go into the war zone after the opening of hostilities with Germany. As director of the division of forestry with the American Expeditionary forces his duty has been to work out problems in connection with the general forestry situation in France, with reference to military needs and future development. He is assigned to no regiment and appears on the records of the service as on temporary detail to the War Department. His original commission was as a major.

MAJOR E E. HARTWICK, 20TH ENGINEERS (FOREST).

MAJOR S. O. JOHNSON, 20TH ENGINEERS (FOREST).

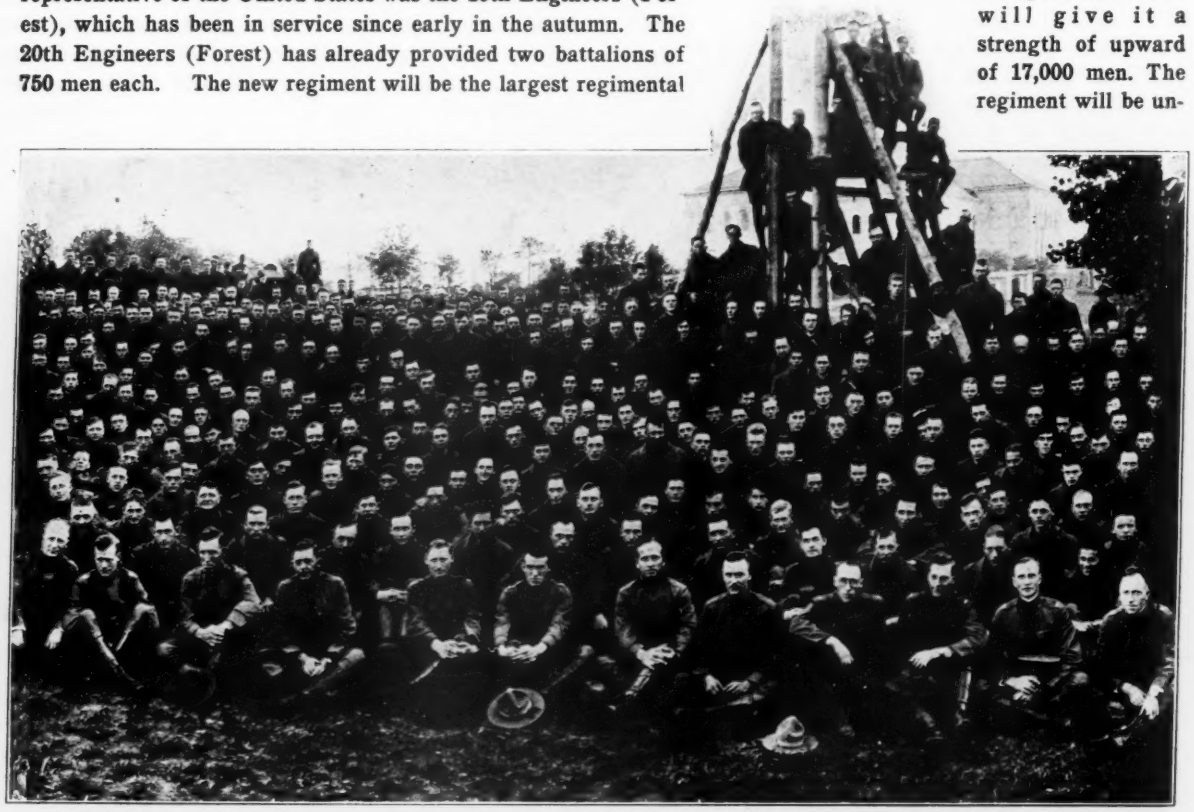
Word also comes from France that Major William B. Greeley has been assigned as deputy director, headquarters, division of forestry, American Expeditionary Forces. He is in charge of lumber operations and has supervision of the entire work in France. Major Greeley went to France early in August. Major Coert DuBois, who was district forester in charge of the National Forests of California, is on the regimental staff of the 10th Engineers (Forest). Donald Bruce (Yale, 1910), professor of forestry at the University of California, has been assigned in charge of timber reconnoisance in France, over a party of six men. Swift Berry, who went as a civilian from the district office of the Forest Service at San Francisco, has been assigned as logging engineer. Theodore S. Woolsey, Jr. (Yale, 1902), who was formerly with the Forest Service and who went to France as a civilian, from Albuquerque, New Mexico, has been assigned to special work and designated as timber negotiator.

The need for skilled workers in the French forests is considered urgent and vital by the army authorities of the United States and the allied nations. Their work will be to provide the timbers and lumber which are essential to military success and which cannot be provided through other channels. To ship the material from America is out of the question because of a lack of transportation facilities.

If the commander of any one of the 30 or more army camps in the United States wants to build a new warehouse or determines that a new bridge is a military necessity he has no difficulty in setting in motion the forces

FIRST AND SECOND BATTALIONS OF

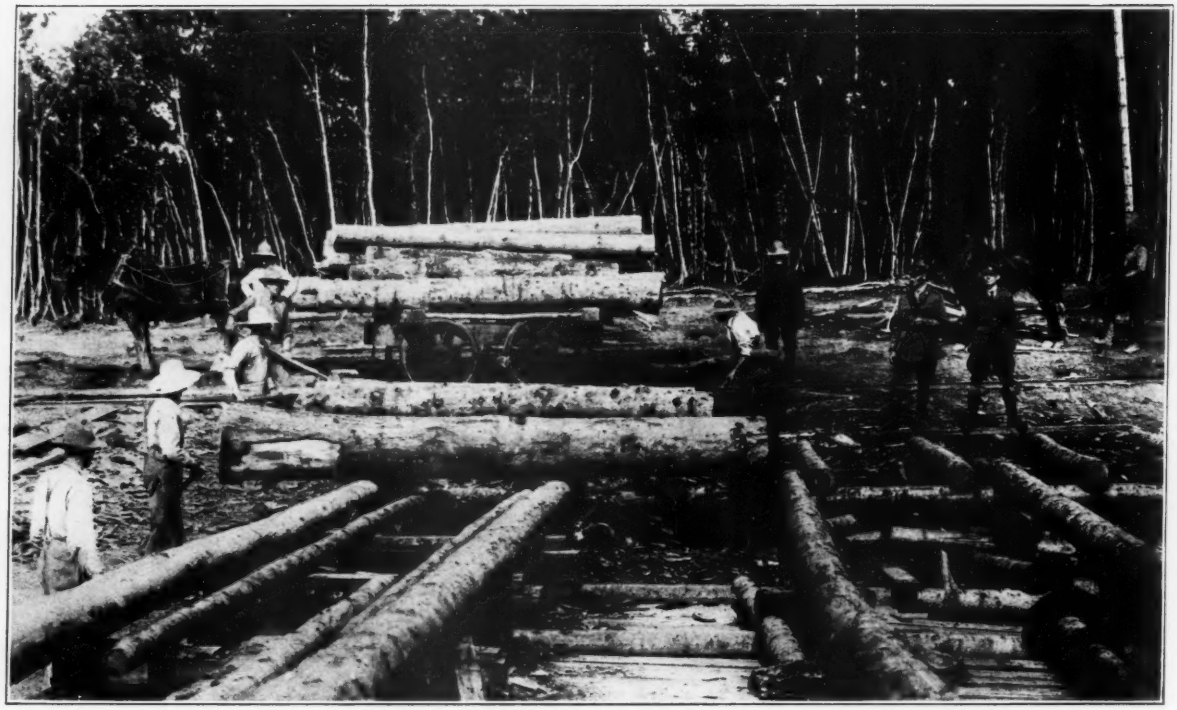
This interesting picture of the initial units of the second regiment to be prepared for service in the French forests was taken at the regimental encampment at American University campus, Washington, D. C. The first regiment to go into the French forests as representative of the United States was the 10th Engineers (Forest), which has been in service since early in the autumn. The 20th Engineers (Forest) has already provided two battalions of 750 men each. The new regiment will be the largest regimental organization in the world. When completed it will have ten battalions of foresters, lumbermen and sawmill workers and nine battalions of laborers for use in connection with the forest operations. This will give it a strength of upward of 17,000 men. The regiment will be un-



THE TWENTIETH ENGINEERS (FOREST)

der the command of Col. W. A. Mitchell, U. S. A. The work of the two regiments, insofar as concerns forestry, lumbering and sawmill operation, will be under the general supervision of Lieut.-Col. Henry S. Graves, who is on leave of absence from his duties as United States Forester. He is director of the division of forestry with the American Expeditionary Forces. Major William B. Greeley, assistant United States Forester and a director of the American Forestry Association, is deputy director of the division of forestry.

Recruiting of the third battalion of the 20th was well under way early in November and this organization will soon be ready for service. The first and second battalions were reviewed by Secretary of War Baker and Chief of Engineers Black on November 10 and received warm praise for their appearance and condition. Some idea of the work the regiment will do in France is given by pictures in this issue.



LUMBERING OPERATIONS WITH THE BRITISH ARMY

In this picture is shown some of the work of the Canadian Forest section on the western front. The men are engaged in bringing in the timber from the forests, ready for sawmill operations. The character of the logs shows the care exercised by the foresters in making selections, while the trees in the background show possibilities for the future of French forestry.

necessary to its construction. The machinery for his purpose is all ready for its work. Through the agencies concerned with army supplies his material is provided by a businesslike organization geared to high measure of efficiency. The Council of National Defense, through its lumber director, designates the lumber that may be delivered with least loss of time and minimum strain on congested transportation facilities. This lumber is promptly acquired through the War Department's purchasing agencies and quickly delivered by railroads trained to giving war-time priority to military shipments.

Suppose, however, that this same commander were in the French war zone where there are no sawmills and no railroads, no Council of Defense and no transportation. His one resource is the native forest. For his lumber he must depend on the trees nearest at hand. To make these trees available is not a problem for the man at a mahogany desk in Washington. It is a job for trained foresters and trained lumbermen on the spot, for experts skilled in the selection of timbers and their swift and workmanlike conversion into building material. It is a task for the ax and the sawmill rather than for the council table and the issuing of typewritten orders. The machinery which makes for efficiency in the United States could not be utilized even if it were available. The one thing that will solve the problem is the immediate activity of such military units as the Forest Regiments, contributed to the allied cause by the American Government.

It is to handle such needs of war that the 10th Engineers (Forest) has already been sent to France and the 20th Engineers (Forest) is being prepared to go across. These organizations will provide lumber for the almost endless needs of the allied armies. Modern warfare demands the construction of wharves, warehouses, storehouses, hospitals, depots, shops and other buildings necessary to shelter the army and its ammunition and supplies. The corps of engineers must build and operate railroads connecting the wharves and shops with the storehouses and depots and the latter with points as close as possible to the scene of fighting. Roads must be constructed and repaired, bridges built, repaired and strengthened and fortifications and other defensive works constructed. For these purposes the trees of the French forests must be felled and converted into railroad ties and other timbers and much of this work must be done by the engineer regiments of American foresters, woodsmen and sawmill men.

The work that takes these men to France is essentially the work of wartime emergency. Military leaders agree that the man who provides lumber for use in the war zone is performing a duty as essential as that of the man on the firing line. This completely disposes of the criticism in some quarters that the expense of sending these regiments to France and maintaining them there makes the cost of their lumber output from $300 to $400 a thousand feet. The absurdity of such criticism is as obvious as its lack of patriotism. Similar reasoning might be applied to the work of the Red Cross and the ambulance service. It might be pointed out that it is much cheaper to let men

be injured here at home than to send them into foreign battlefields, on the theory that a man who becomes ill or injured in an American city may procure hospital treatment at much less cost than is involved in the same treatment in a zone of war. So far, however, no earnest critic has come forward with any such suggestion. Nor has it been urged that the relief agencies be abolished because of the expense involved. Perhaps all of the possibilities in the line of such criticism are not yet exhausted. The further progress of the war may be illumined by many thoughtful suggestions of this nature. In common with the pacifists such profound economists have ideas that are prolific as well as picturesque and we may yet hear them urging that it is cheaper for the soldiers to stay at home than for the government to go to the expense of sending them across the seas. The subject is limitless.

One of the important duties of the trained foresters is the selection of those trees which may be best harvested without ruining the forests. The woodsmen and sawmill workers include men skilled in the handling of lumber from the time the tree is marked for cutting until the log passes through the mill and the material is ready for use in the building of trenches or otherwise.

A constant problem of the American lumber worker in the French forests is the handling of trees in which fragments of shell are embedded. The German spirit of destruction in the enemy's country has left large sections of woodland in which serious damage has been done. Chunks of shell have found lodgment in the bodies of trees and in the course of months these pieces of metal have in many cases become overgrown and difficult of detection through superficial inspection. Consequently there is trouble when the log comes under the saw and this makes the work of producing lumber especially difficult and an undertaking requiring much care.

Another phase of destructiveness practiced by the invaders has been the damage done to orchard trees. Vast areas of the trees were cut down completely and in other vast areas, where pursuit left no time for this process, German "Kultur" expressed itself in cutting off a circle of bark around each tree. By this latter process it was sought to kill apple, peach, plum, apricot and cherry trees which had been growing for years. Trained workers succeeded in saving trees of both classes. Those which had been cut down were grafted to their own stumps by careful treatment and during the recent summer they again blossomed and bore fruit. Those which had been ringed were treated with grafting cement and the wounds carefully bandaged. In this work not only French soldiers were engaged under officers familiar with forestry and tree surgery, but army surgeons and Red Cross workers gave assistance. Frequently use was made of bandages that had been prepared for human wounds. When supplies ran short tar and clay were used instead of cement and twisted moss was tied around the dressed wounds instead of bandages. By these methods years have been saved in restoring the otherwise ruined orchards.

Late in October French aviators found that in the Laon sector the German troops were again resorting to the destruction of villages and trees, indicating another "strategic retreat," similar to that which took place earlier on the Arras Camines front.

Vivid pictures of the ruin that has been wrought is given by German papers. The Berlin Lokal Anzeiger describes a strip of country from six to eight miles in width and extending along the whole of the new German position as having been turned by the Imperial army into dead territory, "presenting a terrible barrier of desolation to any enemy hardy enough to advance against our

WHERE THE SOUND OF THE SAWMILL BLENDS WITH THE ROAR OF ARTILLERY

This is a picture of a sawmill somewhere near the French battle front. Some of the sawmill units are located so near to the fighting lines that they hear the booming of cannon and the bursting of shells as a part of their daily routine. Shells embedded in tree trunks are a frequent source of trouble in the operation of the sawmills, but in spite of the handicaps the output of each unit is constant and indispensable to military operations. The mill here pictured is typical of the environment of the sawmill men who go with the Forest Regiments.

DELIVERY SYSTEM FOR FINISHED LUMBER IN FRANCE.

After the foresters, woodsmen and sawmill workers have finished their share of converting the French forests into construction material the lumber is loaded on powerful trucks for distribution to such building operations as may be going on. This section of the war zone lumber yard is devoted to finished sleepers No time is lost between tree felling and delivery of lumber, as all the work is done under military discipline.

new lines. No village or farm was left standing on this glacis, no road was left passable, no railway track or embankment was left in being. Where once were woods there are gaunt rows of stumps; the wells have been blown up; wires, cables and pipe lines destroyed. In front of our new positions runs, like a gigantic ribbon, an empire of death." This is typical of the situation that has been created by the enemy and which must be over-

WAR ZONE FORESTERS BUILDING RAILROAD

The Canadian Forest Section by no means confines itself to lumbering and sawmill work. Railroads are essential to modern warfare and these men are constructing a line through a French forest. The Forest Section is doing the entire job, from cutting ties to grading and tracklaying.

CANADIAN WOODSMEN IN THE WAR ZONE

These men are types of the forest workers sent overseas as a part of Canada's contribution to the cause of the Allies. The sergeant on the right has three sons serving in France, one of them a captain and the others lieutenants.

come by American forest regiments and engineers. Canada has already sent more than 10,000 men overseas in forest battalions and additional large numbers who had already crossed with the army have been organized into forest companies.

Recruiting of the 20th Engineers (Forest) has been going on throughout the country. Listing offices were established in each state to receive applications for enlistment from men willing to take service in the regiment. These listing offices were in addition to the regular army recruiting offices, through all of which applications are received. As rapidly as accepted and enlisted for service in the regiment the men were gathered at the American University in the District of Columbia, on the campus of which institution the regimental camp is located. In this camp they are immediately placed under military discipline and training, with a routine of daily work calculated to put them into trim for organized work as soon as they reach their destination in Europe. In addition to the men received through the various listing offices and recruiting stations the roster included a large number of men from the drafted army. At the various encampments of the National Army men who are found to have had woods and lumber experience are detailed to the forest regiment and this will doubtless continue to be an important factor in quickly filling the ranks of the organization.

For the new regiment three hundred and nine commissioned officers are required. These officers are men of technical training in various lines. Two-thirds of them

NOT MUCH SUGGESTION OF WAR HERE

Skidding logs is the same thing, whether in a peaceful western logging camp or in the war zone. These men are operating on the western front in France and the timbers are used in trench building and other forms of defense construction.

HOUSING THE FOREST REGIMENT

The type of barracks in which the men live at American University while undergoing the necessary training before being shipped to France to work in the forests of that country.

are practical lumbermen or sawmill operators and one-third technical foresters with long woods experience. In the selection of these officers the Forest Service had the co-operation of fourteen committees of lumbermen representing districts throughout the country. These nominating committees included some of the best-known lumbermen in the United States. Almost every man selected was interviewed by a lumberman's committee or by the Forest Service officials. Many private foresters and forest schools assisted in finding technical men suitable for appointment and it is declared that all the men selected have proved by experience their qualities of leadership and their ability to handle men in large numbers.

The age limits set at the beginning of the undertaking required that all officers of the forest battalions should be not less than 31 years of age. Because of the difficulty of finding enough men suitable for lieutenants the age limit was later lowered to 25. The bulk of the men recommended for lieutenancies range in age from 25 to 35, as captains from 30 to 40 and as majors from 40 to 50. The men who have been recommended have been notified that all further steps, as to physical examination, the issuance of commissions and the order in which successful applicants will be called for service, rest with the War Department. Not all of the men accepted will be called into service at once. In order to provide for future contingencies it was decided to commission at the present time enough officers to care for the other battalions yet to be raised.

Late additions to the roster of officers of the 20th Engineers (Forest) were announced as follows:

Regimental Headquarters—Major E. H. Marks, acting lieutenant colonel; Lieut. J. W. Herbett, veterinary detachment; First Lieut. C. W. Smith, chaplain.

First Battalion Headquarters—First Lieut. R. B. Hill, medical officer; First Lieut. R. F. Roudybush, dental officer.

First Battalion (Company B)—Capt. C. B. Cutting, commanding; Second Lieut. C. B. Bradley.

Second Battalion Headquarters—First Lieut. J. B. Swafford, medical officer; First Lieut. C. P. Hatrick, dental officer.

Second Battalion (Company B)—First Lieut. Charles C. Kelley.

Third Battalion Headquarters—Major B. F. Wade; Capt. E. H. Sargent, adjutant; Capt. O. H. Todd, acting adjutant; Capt. W. H. Estabrook, supply officer, and First Lieut. A. H. Ellison, engineer officer.

Company A—Captain, C. E. Clark; first lieutenants, W. G. Conklin, P. D. Mackie, C. M. Jenkins; second lieutenants, E. B. Birmingham and Harold M. Power.

Company B—Captain, E. P. Dudley; first lieutenants, G. C. Eastman, L. W. Jacobs, M. Vanmeter; second lieutenant, L. B. McDaniels.

Company C—Captain, S. C. Phipps; first lieutenants, C. C. Abbott, H. H. Miller, F. B. Judge; second lieutenants, O. J. Davis, A. L. Hyde and John Summerset.

The district committees of lumbermen for nominating officers were made up as follows:

District No. 1 (Maine, New Hampshire, Vermont, Massachusetts, Connecticut and Rhode Island)—H. B. Stebbins, chairman, H. B. Stebbins Lumber Company, Boston, Mass.; M. A. Brown, Parker & Young Co., Boston, Mass.; F. B. Cutler, Stetler-Cutler Company, Boston, Mass.; H. G. Philbrook, Connecticut Valley Lumber Company, Boston, Mass.; H. W. Blanchard, H. W. Blanchard Lumber Company, Boston, Mass.; C. W. Whitney, Perry-Whitney Lumber Company, Boston, Mass.

District No. 2 (New York)—Ferris J. Meigs, chairman, Santa Clara Lumber Company, Tupper Lake; W. L. Sykes, Emporium Lumber Company, Buffalo; Frank L. Moore, Watertown; Maurice Hoopes, Finch, Pruyn & Co., Glens Falls; J. M. Gamble, Brownville Board Company, Brownville; W. C. Hull, Oval Wood Dish Company, Tupper Lake.

District No. 3 (Pennsylvania and New Jersey)—N. P. Wheeler, Jr., chairman, Wheeler & Dusenbury Lumber Company, Endeavor, Pa.; A. W. Mallinson, Central Pennsylvania Lumber Company, Williamsport, Pa.; R. R. Chaffee, Wheeler & Dusenbury Lumber Company, Endeavor, Pa.

District No. 4 (Delaware, Maryland, Virginia, West Virginia, North Carolina and South Carolina)—C. L. Millard, chairman, John L. Roper Lumber Company, Norfolk, Va.; W. M. Ritter, W. M. Ritter Lumber Company, Columbus, Ohio; J. S. Holmes, State Forester, Chapel Hill, N. C.; George L. Forrester, secretary Western North Carolina Logging and Lumber Company, Asheville, N. C.; E. W. Durant, Jr., E. P. Burton Lumber Company, Charleston, S. C.

District No. 5 (Georgia, Florida and Alabama)—M. L. Fleischel, chairman, Carpenter-O'Brien Lumber Company, Jacksonville, Fla.; R. H. Paul, Watertown, Fla.; M. M. Bond, Bond Lumber Company, Lake Helen, Fla.

District No. 6 (Ohio, Indiana, Illinois, Kentucky and Tennessee)—W. E. DeLaney, chairman, Kentucky Lumber Company, Lexington, Ky.; J. M. Pritchard, secretary, Gum Manufacturers Association, Memphis, Tenn.; R. R. May, Southern Hardwood Traffic Association, Louisville, Ky.

District No. 7 (Michigan and Wisconsin)—John W. Blodgett, chairman, Grand Rapids, Mich.; R. S. Kellogg, National Lumber Manufacturers' Association, Chicago, Ill.; H. C. Hornby, Cloquet, Minn.; Benjamin Finch, Finch Bros., Duluth, Minn.

District No. 8 (Minnesota)—H. C. Hornby, Cloquet, Minn.; F. W. Wilhelmi, Cloquet Tie & Post Co., Cloquet, Minn.; Benjamin Finch, Finch Bros., Duluth, Minn.

District No. 9 (Mississippi and Louisiana)—C. S. Williams, chairman, Patterson, La.; S. T. Woodring, Lake Charles, La.; E. A. Frost, Shreveport, La.; R. B. Carrier, Sardis, Miss.; F. W. Pettibone, Kiln, Miss.

District No. 10 (Missouri, Arkansas, Oklahoma and Texas)—Chas. S. Keith, chairman, Kansas City, Mo.; R. A. Long, Kansas City, Mo.; J. B. White, Kansas City, Mo.; W. R. Pickering, Kansas City, Mo.; L. L. Seidel, Kansas City, Mo.

District No. 11 (Montana, Idaho and Wyoming)—A. W. Laird, chairman, Potlatch, Id.; P. M. Lachmund, Potlatch, Id.; R. M. Hart, Couer d'Alene, Id.; J. A. McCann, Libby, Mont.; Kenneth Ross, Missoula, Mont.; E. H. Van Ostrander, Winchester, Id.

District No. 12 (Washington and Oregon)—George S. Long, chaiman, Weyerhaeuser Timber Company, Tacoma, Wash.; J. J. Donovan, Bloedel-Donovan Lumber Mills, Bellingham, Wash.; E. G. Ames, Puget Mill Company, Seattle Wash.; George M. Cornwall, "The Timberman," Portland, Ore.; A. L. Paine, West Coast Lumberman's Association, Hoquiam, Wash.; Henry Kirk, Beaver Lumber Company, Portland, Ore.

District No. 13 (California and Nevada)—S. O. Johnson, Weed Lumber Company, San Francisco; E. H. Cox, Weed Lumber Company, San Francisco; O. C. Haslett, California Pine Box and Lumber Company, San Francisco; W. P. Johnson, Weed Lumber Company, San Francisco; C. Stowell Smith, secretary California Sugar and White Pine Manufacturers' Association, San Francisco.

District No. 14 (Colorado, Utah, Arizona and New Mexico)—William P. McPhee, chairman, McPhee and McGinnity Lumber Company, Denver, Col.; Smith Riley, District Forester, Denver, Col.; T. A. Shonberg, Continental Tie and Timber Company, Denver, Col.; B. Coldren, Hallack and Howard Lumber Company, Denver, Col., assisted by M. J. Riordan, Saginaw and Manistee Lumber Company, Flagstaff, Ariz.

AMERICAN FORESTERS IN MILITARY SERVICE

This list is compiled from various sources. Every effort has been made to make it complete and accurate, but in the nature of things there are necessarily omissions and errors. The list will be reprinted and increased from month to month. All foresters and others who can supply additional names or note corrections are urged to communicate with American Forestry as promptly as possible, to the end that the list may have full value as a record of the men who have gone to war.

AGEE, Fred. B., Deputy Forest Supervisor, U. S. F. S.
Albano, Jack, forest ranger, U. S. F. S.
Aldous, Tura M., grazing, U. S. F. S.
Alexander, J. B., 1st Lt. Aviation Corps, (Uni. of Wash., '17).
Ames, F. E. (Yale For. School '05).
Anderson, A. C., 2nd Lt. U. S. A. (Uni. of Wash., '17).
Anderson, Emil A., deputy forest supervisor, U. S. F. S.
Archer, Frank L., forest clerk, U. S. F. S.
Atkinson, E. S., (Yale For. School, '16).
Avery, B. F., commissioned in Eng. (Forest) forces; (Yale For. School); Spanish River Pulp and Paper Mills.

BADERTSCHER, Ed., temporary clerk, U. S. F. S.
Baker, Hugh P. (Yale For. School, '04), N. Y. State Col. of Forestry.
Baldenburg, Max B., clerk, U. S. F. S.
Barr, John B., forest ranger, U. S. F. S.
Barlow, Harold (Yale For. School, '14).
Bastian, Clyde E., Corp. 20th Eng. (Forest), (Uni. of Mich., '16).
Batten, R. W. (Yale For. School, '16).
Beaman, Clarence W., messenger, U. S. F. S.
Bedwell, Jesse L., forest ranger, U. S. F. S.
Bell, George R. (Yale For. School, '18).
Benedict, M. S., 1st Lt. 10th Eng. (Forest), for. sup., U. S. F. S
Benedict, Raymond E., Major 10th Eng. (Forest), For. Br. B. C.
Bentley, George A., Capt. Quartermaster's Dept., purchasing agent U. S. F. S.
Bennett, Edwin L., forest ranger, U. S. F. S.
Bernhardt, Carl L., (Uni. of Wash., '18).
Berry, John K., scaler, U. S. F. S.
Berry, Swift, forester, U. S. F. S.
Betts, Fred. H., forest ranger, U. S. F. S.
Bevan, Arthur (Uni. of Wash., '17).
Billingslea, James H., Jr., Top Sergeant (Uni. of Wash., '14), forest ranger, U. S. F. S.
Bird, R. J., Corp. 20th Eng. (Forest), (Cornell, '16).
Bird, Vern A., forest ranger, U. S. F. S.
Bloom, Adolph, Ensign U. S. N. Train. Sta. (Uni. of Wash., '16).
Bonney, Parker S., Sub. Lt. British Navy (Uni. of Wash., '13).
Bowen, Jos. B. (Yale For. School, '17).
Bradley, Tom O. (Mt. Alto), Pa. Dept. For.
Brady, Charles C. (Uni. of Wash. '18).
Breneman, Howard E. (Mt. Alto For. Acad., '17), Co. C., 10th Eng. (Forest), Pa. Dept. For.
Brewster, Donald R., forest examiner, U. S. F. S.
Brindley, Ralph, 2nd Lt. R. O. T. C. (Uni. of Wash., '17).
Brooks, James F., forest ranger, U. S. F. S.
Brown, Bascom H., forest ranger, U. S. F. S.
Brown, Vance, scaler, U. S. F. S.
Browning, Harold A., asst. forest ranger, U. S. F. S.
Broxon, Donald (Uni. of Wash. '14).
Bruce, Donald, Prof. of For., Uni. of Cal. (Yale For. School, '10; assigned in charge of timber reconnoissance in France.
Bryant, Edward S., Capt. 10th Eng. (Forest), for. ins., U. S. F. S.
Buch, John Edward (Mt. Alto For. Acad., '17), Co. C., 10th Eng. (Forest), Pa. Dept. For.

Buck, Shirley, National forest inspector, U. S. F. S.
Burgess, John, surveyor draftsman, U. S. F. S.
Burnham, R. P. (Uni. of Wash., '17).
Buttrick, P. L., Amer. Ambulance Serv. (Yale For. School, '11).

CALKINS, Hugh G. (Yale For. School, '09), forest supervisor, U. S. F. S.
Calloway, G. A. (Uni. of Mo.).
Calvert, Gerald F. (Uni. of Wash).
Cameron, J. F. (Uni. of Wash., '19).
Cappel, Frederick, forest clerk, U. S. F. S.
Cassidy, Hugh O., forest ranger, U. S. F. S.
Cecil, Kirk P., surveyor, U. S. F. S.
Chudderdon, Harold A., forest ranger, U. S. F. S.
Chamberlain, Harry A., forest ranger, U. S. F. S.
Chapman, Charles S., Major 10th Eng. (Forest), (Yale For. School, '02), forestry assistant, U. S. F. S.
Charlson, Alex., (Uni. of Wash., '16).
Christensen, Alfred C., forest clerk, U. S. F. S.).
Clark, Donald H., 1st. Lt. R. O. T. C. (Uni. of Wash., '17).
Clark, E. V., forest supervisor, U. S. F. S.
Clemmons, Walter C., forest ranger, U. S. F. S.
Condon, H. R., 2nd. Lt. 10th Eng. (Forest), Pa. R. R. forester.
Conklin, W. Gardiner, 1st. Lt. 20th Eng. (Forest), (Pa. State For. Acad., '08), Pa. Dept. Forestry.
Cook, A. M. (Yale For. School, '08).
Cook, John W., clerk, U. S. F. S.
Cook, Samuel, forest ranger, U. S. F. S.
Cookston, Roy, Capt. 10th. Eng. (Forest).
Cope, H. Norton, forest ranger, U. S. F. S.
Cownan, Talmadge D., forest ranger, U. S. F. S.
Critchley, Horace F. (Mt. Alto, '13), Res. Off. Tr. Camp, Ft. Niagara, Pa. Dept. For.
Crumb, Isaac J. (Uni. of Wash., '20).
Cuff, Ivan A., forest ranger, U. S. F. S.
Culley, Matthew J., forest ranger, U. S. F. S.
Cuno, John B., 2nd. Lt. 20th. Eng. (Forest).
Curwen, William H., surveyor-draftsman, U. S. F. S.

DALLENBACH, Emil, messenger, U. S. F. S.
De Camp, J. C., grazing assistant, U. S. F. S.
Deering, Robert L., 1st Lt. 10th Eng. (Forest), forest examiner, U. S. F. S.
Deutsch, Henry C., forest ranger, U. S. F. S.
Doggett, William H. (Yale For. School, '17).
Dorrance, John Gordon, 2nd. Lt. E. O. R. C.
Dorward, D. L. (Yale For. School, '14).
Douglass, C. W. H., Aviation Corps (N. Y. State Col. of Forestry, '15), American Forestry.
DuBois, Coert, Major 10th Eng. (Forest), dis. forester, U. S. F. S.
Dubuar, James F., forest assistant, U. S. F. S.
Dunn, Beverly C., Adjutant 10th. Eng. (Forest).
Dunning, Duncan, forest assistant, U. S. F. S.
Dunston, Clarence R., 1st. Lt., U. S. Indian Service.
Dunwoody, W. B. (Yale For. School, '16).

ELDREDGE, Inman F., Capt. 10th Eng. (Forest), forest supervisor, U. S. F. S.
Elliott, Harry R., forest ranger, U. S. F. S.
Emerick, Lloyd P., forest clerk, U. S. F. S.
Emerson, J. Ward, forest ranger, U. S. F. S.
Evans, Vincent (Uni. of Wash., '16).
Ewing, Robert B., forest ranger, U. S. F. S.

FAIRCHILD, Rollin A., forest clerk, U. S. F. S.
Fifer, Charles (Uni. of Wash., '20).
Fish, Harold (Uni. of Wash., '18).
Fisher, David (Uni. of Wash., '14).
Foess, Jacob E., 20th Eng. (Forest), (Mich. Ag. Col., '17).
Foley, A. C., Corp. 20th Eng. (Forest), (Uni. of Mich., '18).
Foran, Harold (Uni. of Wash., '16).
Fowler, Frederick H., district engineer, U. S. F. S.
Frankland, James, forest ranger, U. S. F. S.
Fritchle, C. R. (Uni. of Mo.).
Fritz, Emanuel (Yale For. School, '14), forest asst., U. S. F. S.
Fuller, Francis S., forest assistant, U. S. F. S.

GALER, George E., forest ranger, U. S. F. S.
Gallaher, W. H., 2nd Lt. (Yale For. School, '10), U. S. F. S.
Garrett, C. B. (Uni. of Wash., '16).
Gaylord, Donald (Yale For. School, '15).
Gebo, L. W., 20th Eng. (Forest), (Cornell, '16).
Gibbons, William H., 2nd. Lt., forest examiner, U. S. F. S.
Gill, Thomas H. (Yale For. School, '15), forest ranger, U. S. F. S.
Gilman, John, forest ranger, U. S. F. S.
Gilson, R. M. (Yale For. School, '17).
Girk, Royal J., forest clerk, U. S. F. S.
Godwin, D. P., 1st Lt. 10th Eng. (Forest), forest exam., U. S. F. S.
Goodman, Walter F., forest ranger, U. S. F. S.
Graham, Paul (Uni. of Wash., '13).
Granger, C. M., assistant district forester, U. S. F. S.
Graves, Henry S., Lt. Col., director, division of forestry headquarters, American Expeditionary forces; United States Forester.
Greeley, William B., Major, deputy director, division of forestry headquarters, American Expeditionary forces; assistant United States Forester.
Grefe, Raymond F., forest ranger, U. S. F. S.
Guthrie, John D. (Yale For. School, '06), forest sup., U. S. F. S.
Guthrie, Richard T., forest examiner, U. S. F. S.

HAASIS, F. W. (Yale For. School, '13).
Hackett, William, forest ranger, U. S. F. S.
Hall, R. C. (Yale For. School, '08), forest examiner, U. S. F. S.; assigned to timber reconnoissance in France.
Hansen, Thorvald (Yale For. School, '17), forest asst., U. S. F. S.
Hansson, Arnold (Yale For. School, '17).
Harding, Charles C. (Yale For. School, '16).
Harlacher, Josef (Mt. Alto, '17), 20th Eng. (Forest), Pa. Dept. For.
Harley, Percy H., forest clerk, U. S. F. S.
Harmelling, H. (Uni. of Wash., '12).
Hendrickson, Guy C., forest clerk, U. S. F. S.
Hendrix, Albert W., forest ranger, U. S. F. S.
Hicock, Henry W. (Yale For. School, '15).
Hicks, L. E., forest ranger, U. S. F. S.
Hill, F. C., forest ranger, U. S. F. S.
Hirst, E. C. (Yale For. School, '09), state for., New Hampshire.
Hogentogler, Joseph R. (Mt. Alto, '12), Pa. Dept. For.
Holt, Felix R. (Yale For. School, '02).
Hotze, E. B. (Uni. of Mo.).
Hope, L. S. (Yale For. School, '16).
Houpt, William E. (Mt. Alto, '09), 20th Eng. (Forest), formerly Pa. Dept. For.
Houtz, Jesse (Mt. Alto, '13), Field Artillery, formerly Pa. Dept. For.
Huff, Rolland, forest ranger, U. S. F. S.
Hull, J. H. (Yale For. School, '11).
Humphrey, J. C. H. (Yale For. School, '09).
Hussey, Ralph W., forest ranger, U. S. F. S.

INGALLS, E. E. (Yale For. School, '17).
Inskeep, Raymond P., forest ranger, U. S. F. S.
Isola, Vico C. (Yale For. School, '14).
Irwin, James A. (Mt. Alto, '12), Sergt. 10th Eng. (Forest), formerly Pa. Dept. For.

JANOUCH, Karl L., forest ranger, U. S. F. S.
Johnson, O. S., Sgt. 20th Eng. (Forest) (Uni. of Minn., '16).
Jones, E. F., forest examiner, U. S. F. S.
Jones, Luther G. (Yale For. School, '16).
Judson, Luchard (Yale For. School, '17).

KELLEY, Evan W., Capt. 10th Eng. (Forest), forest examiner, U. S. F. S.
Ketcham, Louis, forest ranger, U. S. F. S.
Keyes, John H., 20th Eng. (Forest), (Yale, '14).
Ketridge, John C., forest examiner, U. S. F. S.
Kiefer, Francis, Capt. E. O. R. C., asst. dist. forester, U. S. F. S.
Kimball, George W., forest examiner, U. S. F. S.
King, Robert F., 2nd. Lt. Coast Artillery (Uni. of Wash., '19).
Kingsley, Ray M., forest ranger, U. S. F. S.
Kittredge, Joseph, Jr., forest examiner, U. S. F. S.
Klobucher, F. J. (Yale For. School, '16), forest ranger, U. S. F. S.
Knowlton, H. N., engineer in forest products, U. S. F. S.
Kobbe, William H. (Yale For. School, '04).
Koomey, L. H. (Yale For. School, '12).
Kraebel, Charles J., forest assistant, U. S. F. S.
Kraft, F. G. (Uni. of Mo.).
Krause, John E., forest ranger, U. S. F. S.

LAFON, John, Capt. 10th Eng. (Forest), Forest Branch B. C.
Larzon, Arthur K. (Uni. of Wash.).
Lee, Chester A. (Yale For. School, '17).
Leach, Walter (Mt. Alto, '14), 314th Inf., Pa. Dept. For.
Lentz, Gustav H. (Yale For. School, '17).
Lewis, Ferry D., forest ranger, U. S. F. S.
Lindsey, Eugene L., 1st Lt. 10th Eng. (Forest), (Yale For. School. '19), forest examiner, U. S. F. S.
Littlefield, Theron R., forest ranger, U. S. F. S.
Loveman, A. M. (Yale For. School, '16).
Lowermilk, Walter C., forest ranger, U. S. F. S.
Lundgren, Leonard, Captain, engineer, U. S. F. S.
Luther, T. F., 20th Eng. (Forest), (Cornell, '17).

MACKECHNIE, A. R., 2nd Lt. U. S. A. (Uni. of Wash., '18).
Malmstein, Harry E., grazing assistant, U. S. F. S.
Mackworth, G. D. (Yale For. School, '17).
Marsh, A. Fletcher (Yale For. School, '11).
Masch, Walter (Mt. Alto), 20th Eng. (Forest), Pa. Dept. For.
Mason, David T., Capt. 10th. Eng. (Forest), Uni. of Cal. (Yale For School, '07).

McCullough, Thomas E. (Yale For. School, '11).
McGillicuddy, Blaine (Uni. of Wash.).
McGlaughlin, Eugene R., 20th Eng. (Forest), (Ohio State Uni.).
McKnight, Roscoe, 1st. Lt. 10th Eng. (Forest), U. S. F. S.
McNulty, L. Edgar (Mt. Alto For. Acad., '17), Co. C., 10th Eng. (Forest), Pa. Dept. For.
McPherson, Benj. D. (Mt. Alto For. Acad., '16), 10th Eng. (Forest), Pa. Pept. For.
Meek, Chas. R. (Mt. Alto, '12), 20th Eng. (Forest), Pa. Dept. For.
Mendenhall, Fred D., surveyor-draftsman, U. S. F. S.
Meyer, Leo. W. (Yale For. School, '17).
Middour, Joseph C. (Mt. Alto. For. Acad., '16), Co. C., 10th Eng. (Forest), Pa. Dept. For.
Miles, Clark, forest examiner, U. S. F. S.
Millar, W. N., Capt. 10th Eng. (Forest)), (Yale For. School, '08).
Miller, Edwin B. (Mt. Alto For. Acad., '17), 10th Eng. (Forest), Pa. Dept. For.
Miller, Fred H., forest ranger, U. S. F. S.
Minner, Clifford R., forest ranger, U. S. F. S.
Moir, W. Stuart (Yale For. School, '17).
Montgomery, Ray C., forest ranger, U. S. F. S.
Montgomery, W. E. (Mt. Alto, '13), Res. Off. Tr. Camp, Augusta, Ga., Pa. Dept. For.
Moore, Barrington, Capt. (Yale For. School, '08), U. S. F. S.
Moore, W. M., forest examiner, U. S. F. S.
Morton, J. Newton (Mt. Alto For. Acad., '16), Co. C., 10th Eng. (Forest), Pa. Dept. For.
Mosch, Walter (Mt. Alto) 20th Eng. (Forest), Pa. Dept. For.
Murphy, E. C., 2nd Lt., U. S. A. (Uni. of Wash., '20).
Murphy, R. A. (Yale For. School, '17).
Mutz, George, forest ranger, U. S. F. S.
Myers, Frank B., forest assistant, U. S. F. S.

NELSON, Enoch W., grazing assistant, U. S. F. S.
Nelson, Oscar L., forest ranger, U. S. F. S.
Nevitt, John V., forest ranger, U. S. F. S.
Neasmith, John J., 20th Eng. (Forest), (Syracuse, '17).

OAKLEAF, H. B., forest examiner, U. S. F. S.
Odell, W. T. (Uni. of Wash., '12).
Oliver, J. Earl, forest ranger, U. S. F. S.
Oles, W. S., 20th Eng. (Forest), (Cornell, '16).
Orr, Ronald H., 20th Eng. (Forest), (Biltmore For. School, '09).

PAETH, William J. (Yale For. School, '12), forest assistant, U. S. F. S.
Paine, F. R. (Yale For. School, '14).
Paine, Topliff O., forest ranger, U. S. F. S.
Paxton, Percy J. (Yale For. School, '09), forest exam., U. S. F. S.
Peck, Allen S., Major, 10th Eng., '09), forest insp., U. S. F. S.
Peck, E. C. (Yale For. School, '18)).
Pilcher, Rufus J., forest ranger, U. S. F. S.
Plummer, Donald (Uni. of Wash., '20).
Port, Harold F. (Mt. Alto For. Acad., '16), Co. A., 10th Eng. (Forest), Pa. Dept. For.
Porter, O. M. (Yale For. School, '15).
Powell, Harry A., British Army, (Uni. of Wash.).
Powers, James E. (Mt. Alto, '15), Artillery, Pa. Dept. For.
Powers, Victor S. (Uni. of Wash., '18).
Prichard, R. P. (Yale For. School, '09).
Pryse, E. Morgan, forest assistant, U. S. F. S.

RAINSFORD, W. K. (Yale For. School, '06).
Ramsdell, Willett F., deputy forest supervisor, U. S. F. S.
Rase, Frederick W., surveyor, U. S. F. S.
Rand, E. A., 1st Sgt., 20th Eng. (Forest), (Uni. of Me., '14).
Riblett, Carl H., forest ranger, U. S. F. S.
Richards, E. C. M. (Yale For. School, '11).
Ricketts, Howard B., clerk, U. S. F. S.
Ringland, Arthur C., Capt. 10th Eng. (Forest), (Yale For. School, '05), forest inspector, U. S. F. S.
Rixson, C. L., forest clerk, U. S. F. S.
Roberts, Wesley K. (Uni. of Wash., '18)).
Robertson, Colin C. (Yale For. School, '07).
Robinson, S. E. (Yale For. School, '12)).
Rockey, K. E. (Yale For. School, '12).
Roeser, Jacob, Jr., forest assistant, U. S. F. S.
Root, Lloyd (Mt. Alto For. Acad., '17), Co. C., 10th Eng. (Forest), Pa. Dept. For.
Rowland, Arthur L. (Mt. Alto), Pa. Dept. For.
Rowland, Horace B., Jr. (Mt. Alto. For. Acad., '15), Co. F., 10th Eng. (Forest), Pa. Dept. For.
Rush, William M., forest ranger, U. S. F. S.
Russell, Joseph P. (Uni. of Wash.).

SADLER, George M., forest ranger, U. S. F. S.
Salton, Robert C., forest ranger, U. S. F. S.
Sanford, E. C., 1st Lt., 10th Eng. (Forest), forest supervisor, U. S. F. S.
Sanger, Owen J., 1st. Lt. Canadian Contingent (Uni. of Wash.).
Schaefer, Oscar F., forest ranger, U. S. F. S.
Schmaelzle, Karl J. (Uni. of Wash.).
Schmitz, Henry (Uni. of Wash., '15).
Schowe, William A., forest ranger, U. S. F. S.
Scofield, William L. (Yale For. School, '13), for. rang., U. S. F. S.
Segur, Lewis L., forest ranger, U. S. F. S.
Seltzer, J. W., 2nd Lt., 10th Eng. (Forest), (Pa. State For. Acad., '09), forester N. J. Zinc Co.
Senft, Walter M. (Mt. Alto), Pa. Dept. For.
Sheeler, George W. (Mt. Alto, '12), Co. C., 502d Service Bat., Pa. Dept. For.
Shepard, H. B., 2nd Lt., 10th Eng. (Forest), forester Lincoln Pulp Co.
Shenefelt, Ira Lee (Mt. Alto, '16), Co. C., 502d Service Bat., Pa. Dept. For.
Siggins, Howard W. (Mt. Alto For. Acad., '14), Co. C., 10th Eng. (Forest), Pa. Dept. For.
Silcox, F. A. (Yale For. School, '05), district forester, U. S. F. S.
Skeels, Dorr, Capt. 10th Eng. (Forest), Uni. of Montana.
Slomaker, L. Vernon, telephone engineer, U. S. F. S.
Smith, A. Oakley (Yale For. School, '14).
Smith, Edwin F., forest ranger, U. S. F. S.
Smith, E. H., 1st. Lt. 316th Inf., Pa. State Forestry Dept.
Smith, Edward S. (Mt. Alto, '16), Nat. Army, Camp Meade; Pa. Dept. For.
Smith, H. A. (Mt. Alto, '16), Field Hospital Ser., Pa. Dept. For.
Stadden, Robert W. (Mt. Alto, '14), 20th Eng. (Forest), Pa. Dept. For.
Speers, Vincent E., forest clerk, U. S. F. S.
Speidel, H. A. (Yale For. School, '14).
Staebner, R. C.; eng., Little River Lumber Co., Townsend, Tenn.
Stanton, L. G. (Uni. of Wash., '18)).
Stevens, Carl M. (Yale For. School, '12).
Stewart, Clifford H., forest ranger, U. S. F. S.
Stewart, Jefferson M., clerk, U. S. F. S.
Stone, Everett B. (Yale For. School, '17).
Stuart, R. Y., Capt., forest inspector, U. S. F. S.
Stults, Hal L., forest ranger, U. S. F. S.
Swapp, Roy, forest ranger, U. S. F. S.
Sweeney, Joseph A., forest ranger, U. S. F. S.
Sweeney, Michael J., forest examiner, U. S. F. S.

THOMPSON, Jackson (Uni. of Wash., '16).
Thompson, Raymond H., forest ranger, U. S. F. S.
Tweedy, Temple (Yale For. School, '14).
Thomas, Harry L., Co. C., 10th Eng. (Forest), for. rang., Pa. Dept. For.
Thomas, John, 10th Eng. (Forest), for. rang., Pa. Dept. For.

VAN WICKLE, J. M. (Uni. of Wash.).
Van Arsdall, Howard (Mt. Alto), Pa. Dept. For.
Voight, Alfred W., forest ranger, U. S. F. S.
VanHorn, Harry E. (Mt. Alto For. Acad., '14), Co. A., 10th Eng. (Forest), Pa. Dept. For.

WAGNER, G. C., Jr. (Yale For. School, '18)
Walsh, Harry A., Capt. Quartermaster's Dept., U. S. F. S.
Ward, Herbert S., clerk, U. S. F. S.
Weitknecht, Robert H., forest assistant, U. S. F. S.
Wells, Arthur B. (Mt. Alto, '11), 18th Machine Gun Co., Pa. Dept. For.
Westfeldt, W. O. (Yale For. School, '16)).
White, Martin E., forest ranger, U. S. F. S.
White, William E., forest examiner, U. S. F. S.
Wilcox, J. M., Corporal Inf. (Uni. of Wash., '20).
Williams, Hubert C., 1st. Lt. 10th Eng. (Forest), (Yale, '08).
Wilson, Stanley F. (Yale For. School, '14), for. rang., U. S. F. S.
Wirt, William (Uni. of Wash., '18).
Wisner, — —., Corp. 20th. Eng. (Forest), (Syracuse, '17).
Wohlenburg, E. F., 2nd Lt., 10th Eng. (Forest), forest examiner, U. S. F. S.
Wolfe, Kenneth, forest ranger, U. S. F. S.
Wolfe, Stanley L., 1st Lt., U. S. F. S.
Woolsey, Theodore S., Jr. (Yale, '02); designated as timber negotiator in France.
Woodruff, James A., Lt. Col. 10th Eng. (Forest).
Woods, J. B., 1st Lt. 10th Eng. (Forest).
Work, Herman, 1st Lt. 10th Eng. (Forest), deputy forest supervisor, U. S. F. S.
Wulff, Johannes (Yale For. School, '17).

YEOMANS, E. J. (Yale For. School, '12), for. rang., U. S. F. S.
Young, L. P., 2d Lt. Inf. (Uni. of Wash., '17).

ZELLER, R. A., forest assistant, U. S. F. S.
Zieger, Robert H., forest ranger, U. S. F. S.
Ziegler, E. A., Capt. Coast Art., Direc. Pa. State For. Acad.

FORESTRY AT BATES COLLEGE

UNDER the will of Benjamin C. Jordan, of Alfred, Maine, Bates College, of Lewiston, Maine, received a legacy for the development of a Department of Forestry. There were conditions under the will, as there were various legatees, including daughters of Mr. Jordan, and there were numerous obligations to be met before any part of the legacy would be available. The various outstanding obligations have now been met. A daughter of Mr. Jordan, under the terms of his will, was to be the recipient of all the income of the estate that might accrue when all debts had been paid. She is a graduate of Bates and in loyalty to her alma mater has relinquished a share of her income in order that her father's wishes might be carried out as early as could be found practicable.

Mr. Jordan had been for many years a trustee of Bates and one of his brothers is the head of the Department of Chemistry at the college. The college will ultimately have large resources for its forestry work, but for a few years the amount available will be only moderate. It does, however, permit the college to employ a thoroughly prepared man to take charge of the department. It also affords the requisite laboratory facilities. The amount available for this department is likely to increase from year to year. The estate of Mr. Jordan included some 14,000 acres of good timber land, situated in different counties in Maine.

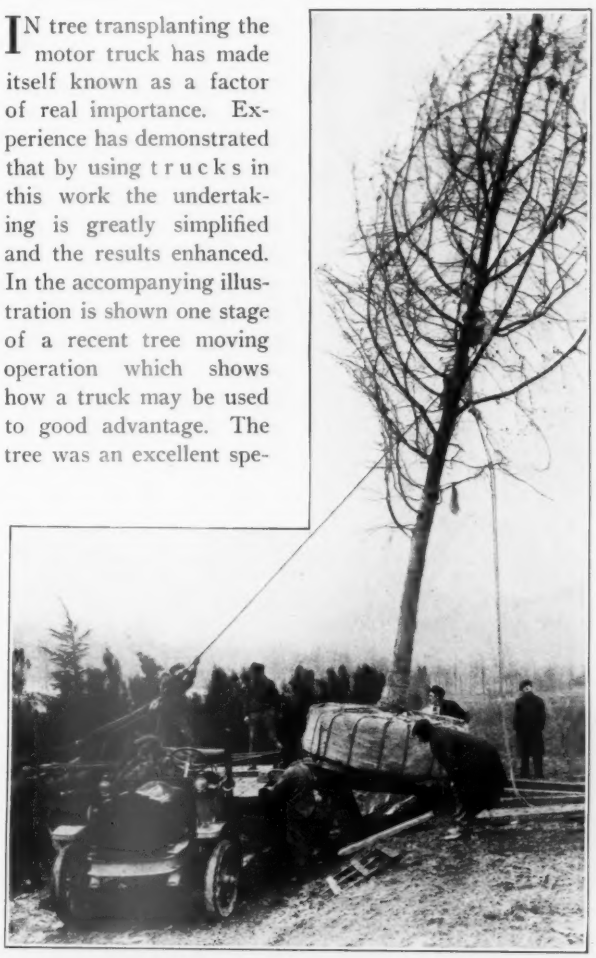
President George C. Chase writes AMERICAN FORESTRY that Bates is now endeavoring properly to correlate her educational work in forestry with other work in such a way as to give a good knowledge of forestry to students interested in this subject and, at the same time, to assure to them a reasonable degree of culture and breadth of knowledge.

CHANGES AT THE GEORGIA STATE FOREST SCHOOL

SINCE it was necessary to divide the work left by the men who had been called under the draft at the State Forest School of the University of Georgia, at Athens, the Forest School has been combined with the division of plant pathology. Most of the efforts at the school during the period of the war will be directed toward a control of plant diseases, supplemented, of course, by a certain amount of work in forestry. Two projects have been approved, one of which provides for a field agent in forestry and plant pathology, and the other for a specialist in plant pathology. Under the first, Mr. James Godkin, who had his undergraduate work at Connecticut and his graduate work at the Michigan Agricultural College, has been appointed. An arrangement has been made with Dr. Humphrey, of the Office of Cereals, for the stationing of six specialists within the State, whose sole work will be the control of cereal diseases, and there will be full and cordial co-operation between the State and the university in the conduct of this work. It is now confidently expected that the coming year will see at least a dozen men specializing in plant pathology at work within the State, the result of whose labors will be of great benefit and value.

TREE'S LONG JOURNEY ON TRUCK

IN tree transplanting the motor truck has made itself known as a factor of real importance. Experience has demonstrated that by using trucks in this work the undertaking is greatly simplified and the results enhanced. In the accompanying illustration is shown one stage of a recent tree moving operation which shows how a truck may be used to good advantage. The tree was an excellent specimen of oak, forty feet in height and 13 inches in diameter. The trip made by this oak was from its native nursery, near Philadelphia, to the estate of Eugene Du Pont, at Greenville, Delaware, a distance of 42½ miles. The tree was lifted from the ground with its roots encased in a ball of earth weighing approximately 8,500 pounds. The weight of tree and rigging was estimated at 2,000 pounds, making a total weight of 10,500 pounds. The tree was loaded and unloaded without injury and the trip was made without mishap of any kind. The success of the undertaking has convinced those concerned that the use of the motor truck in tree removal opens up new possibilities for transplanting.



AN Omaha chemist is experimenting with the roots and stems of manzanita, a common shrub which forms a part of the chaparral on the Pacific Coast, as a source of dye. A carload of the wood has recently been shipped from Northern California for this purpose.

THE annual value of the farm woodlot products of the United States is $195,000,000.

THE PINE

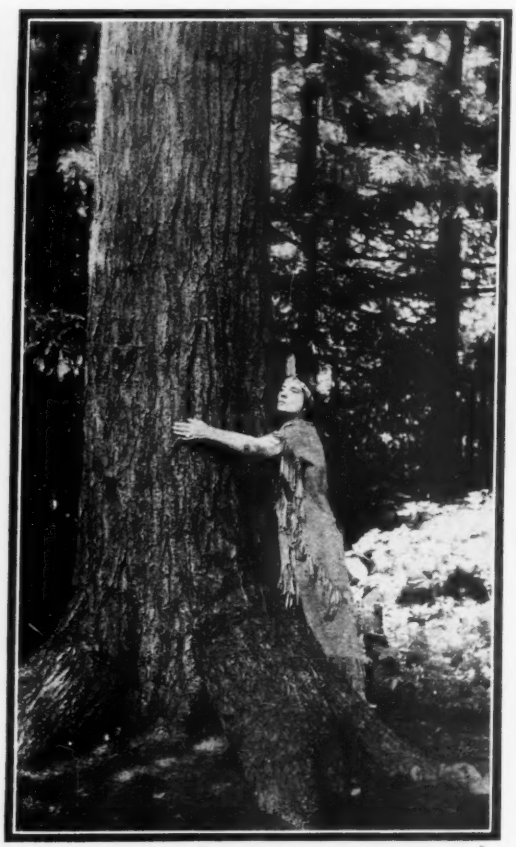
BY MABEL POWERS

(Yeh sen noh wehs --- One Who Tells the Stories)

AND thus spake Osoah, the Pine, unto me in the Land of the Mohawks.

In Nature's law only is there freedom, strength, content. I know for I have kept Her Law.

I am Osoah, the Pine, Myself--the Guide of the Forest. I point the way to men. Hearken unto my voice, observe my signa and take to the Great Sky Road.



From my topmost branches thou may'st determine thy direction and keep the needle of thy soul pointing true north.

When the sun sleeps and the cloud blanket drops low, from me can'st thou learn where the east trail winds and the west trail leads. Look to my towering crest.

Wound me, bruise me and I will pour the balm of my love upon thee. In the breath of my spirit may'st thou find healing and peace.

Always my arms are outstretched to welcome and bless thee, the great heart of my tree trunk yearneth for thee.

Summer and winter, in sunshine and storm, yea in all seasons and weathers, I stand strong, steadfast, unchanged, the same.

In cities distant, in the maddening whirl of self and things, my call ever com'st to thee.

As in a dream thou hear'st my low-breathed love murmurs and seekest me as the young the brooding mother bird.

Again and again shalt thou return, sit at my feet--and listen until thou too become steadfast, true, Thyself, in love and truth fulfilling the law.

The Sky is not far! Osoah the Pine hath spoken, and hath pointed thee, the Great Sky Trail!

"DOCTOR MOUNTAIN"

BY MARK DANIELS

FORMER GENERAL SUPERINTENDENT OF NATIONAL PARKS

SOME true friends of old Daniel Grogan, whose machine shop had of late been failing to pay dividends, finally persuaded him to take a trip to the mountains. They had called at his office one day and told him he was going with them to the Sierras, where health and happiness lie.

"Go on wid ye! It's you boosters that do most av the lyin'," he said, and slid farther down into his chair thereby bringing a recently acquired embonpoint into more or less violent contact with the corner of the table.

Perhaps it was the whispered expletive which gave them the cue, for they finally succeeded in persuading Mr. Grogan that a trip to the mountains would not only take a load off his feet but off his mind as well, for he had been failing to outwit his competitors for some time, and it worried him. A few days later, three of them emerged from a grove on the north side of the Valley and stood, breathless, before the indescribable majesty of the Falls of the Yosemite.

THE GLORIOUS BEAUTY OF THE YOSEMITE NATIONAL PARK—THE UPPER FALLS

Truly has it been said: "I will open rivers in high places and fountains in the midst of the valleys"—and many there are who can bear witness to the wonderful healing brought to sick bodies and jaded nerves through the medium of inspiration found here.

Grogan slowly removed his hat and above the roar of the Falls were heard the words, "Great God Almighty!" in Grogan's ringing bass. The three stood reverently for several minutes before those crashing falls, that towered like a pillar of purity a half mile above them—and then silently walked away.

For the next ten days Daniel Grogan was seen in early morning and at sunset on the trails and in the canyons, on the mountain peaks and below the roaring falls, by the placid lakes and beneath the towering sequoias; a silent and thoughtful man.

When the time came to leave he wrung the Superintendent's hand.

"I've seen but a bit of Yosemite Park. But I've seen yure river on ind, yure half dome skyscraper, and yure trees that are so big ye can only see 'em in yure dreams, and I've got more inspirations out av thim than are in two ingine boilers full o' highballs. I'm going back to Frisco, too, an' build a machine shop that'll make more noise

than yure upinded river, the difference bein' that there'll be no wather in it, save for me own drinkin', which same'll be all I'll be drinkin' this day forth."

As to his success in fulfilling his promises, it may be said, in passing, that upon his death he left an estate of such size that the income from it pays the traveling and other expenses of his two progeny, who annually go abroad for mountain scenery.

Mr. Grogan found, as others have found and others will ever find, that health of body is only one of the rewards of travel in the rugged mountains. There is the effect upon the mind, the imagination—upon the soul, as well.

The statements of the doctors, that a trip to the mountains each year will keep us in better health, has lost its punch. The fact that the capacity to resist the inroads of disease and the lure of the fleshpots decreases inversely, as the square of the waist measure has lost its terrors. So long as the business is running along smoothly and the tango tea is popular, why worry about the increasing pressure of the waistcoat? Why heed the cry of wolf? But it frequently occurs that the business ceases to run so smoothly, and all efforts fail to bring imagination, inspiration and ingenuity to the rescue. Here is a pure case for the mountains.

HERE IS FOUND REST AND PEACE—THE STILLNESS OF THE WATER AND THE QUIET OF THE HILLS

Not all the Alpine scenery of this continent is to be found in the Northwest. Colorado and the Rocky Mountain National Park boast of some of the best that we have, which claim attention on the ground of propinquity as well as for their native beauty.

There is no doubt that certain of our mental faculties become sluggish through disuse. Few men can follow, for many years, the humdrum existence of daily business life, and retain all their mental faculties in healthy, active condition. Generally it is the imagination which flags first. When this condition comes on, what is needed is a shock, such as Mr. Grogan received when Yosemite Falls burst upon his view. It is a sort of mental shower, acting upon the mind much as a cold plunge after the steam room acts upon the body.

The high mountains give you just this, and more. After your dormant faculties have been shocked into life by their stupendousness, they present you, on every side, with sublimity, magnificence and grandeur that stimulate the imagination and rejuvenate ambitions. It is a serious case, indeed, which does not return, after a three-week treatment with Nature's mental glove stretcher, filled with new ideas and fired with the ambition to carry them out.

I was once working up the trail that leads along Bubbs Creek from King's River Canyon to Kearsarge Pass, on the summit of the high Sierra of California. There is a climb of about 8,000 feet from the floor of the canyon to the summit, but the view from the top is worth the climb. The crest of the Sierra Nevada in this vicinity is an endless line of jagged peaks and minarets which, silhouetted against a sapphire sky, appear as sharp as saw teeth. These mountains rise more or less gradually from the west to an elevation between 13,000 and 14,000 feet, and, as if satisfied with having reached the highest elevation in the United States, drop off abruptly to an elevation 3,000 to 4,000 feet above sea level.

As we approached the summit, a motionless figure was distinguished, sitting upon a rock on the very edge of the Divide. He was so still that he seemed a part, as he was in color, of the brownish-grey rocks of this edge of

the earth. Ignoring me in a manner that stamped me as a tenderfoot, he asked Pete, the packer, if he had any "chewin'."

Pete silently handed him a plug of tobacco, that all but disappeared behind the hairy front, which immediately and silently began working upon the biggest chew of tobacco I have ever seen taken. He deigned no reply to Pete's remark that he might better have kept the plug and returned the chew, nor gave any sign of gratitude, save by a slight moisture in his sun-reddened, grey eyes. The silence, for some minutes, was broken only by the hiss of tobacco juice as he spat at a small rock that seemed particularly placed by nature as a target. Finally, this sort of chewing sphinx apparently felt that he had reduced his hunk of "miners' candy" to a constituency that justified letting up on the helpless thing for, as I was about to frame a question, he turned to me and said:

"Son, I've got a mine about a mile lower down and it's good, if anyone can figger a way to git machinery in and ore out of 'er. On my way up, I lost part o' my pack and all o' my terbaccy. While I was a-sittin' here, tryin' ter decide whether ter go back for terbaccy an' another whirl at the old mine, a idea struck me. Settin' on top o' the world here, where you kin look straight down about two mile, sorter wakes a feller up an' a settin' here, I figgered how I could work that ole mine. All I needed then ter make this view perfect, was a plug o' Honey Dip Twist."

Pete reminded him that he was chewing on a hog's share of one at that moment.

"Sure," he said. "I guess this is my lucky day. If those desert rats 'd run up here oncet in a while, I b'lieve they'd git enough ideas ter make them Bodie Mines pay big. You see, up here, you're two or three mile nearer God," (pointing to the Owens River, 10,000 feet below, which looked like nothing so much as a fine silver thread reaching toward Death Valley, over 14,000 feet below us), "and mebbe that's how come these idees so fresh and easy like."

We talked about mines and mountains, and left him adjusting the pack to a tiny burro which had been nodding in the shade of a huge boulder. All thoughts of this curious philosopher were banished by the glorious scene over the Owens River Valley, as we followed the trail that led down, down, down, to the little town of Independence.

During the last half mile of descent the rays of the setting sun and the shadow of the range we were on slowly crept up the Panamints until only the tops were

FISH CREEK CANYON, APACHE TRAIL, ARIZONA

The canyons of Arizona seem to have supplied the colors of the world in making. Purples, greens, blues, scarlets and tawny browns shift and play with kaleidoscopic variety as the sun passes overhead.

THE WONDERFUL COWLITZ GLACIER, IN RAINIER NATIONAL PARK

This spot, one of the best-loved by the tourist in the National Parks, shows the Cowlitz Glacier, one of the few presenting the actual appearance of having flow lines It is one of a system of ninety or so glaciers that mantle one of the most noble mountains of the earth.

HERE WE FEEL THE VEIL OF MYSTERY SHROUDING THE LIVES OF A FORGOTTEN RACE

These are the Tonto Cliff Dwellings in Arizona. About three miles from the Roosevelt Dam are two groups, one of which is shown in this photograph. An automobile may be driven to within a few hundred yards of them Nothing that the Forest Service has taken up in the way of preservation in this vicinity has met with more approval on the part of the residents of the district than its announcement that these ruins are to be repaired and set aside.

bathed in a russet glow which seemed to remain for a spell, to be suddenly snuffed out, leaving us, as we emerged onto the valley floor, to follow the trail by the moon's pale light.

Four years later, as I was walking along the Beach Drive in San Francisco, I noted an automobile of considerable wheel base and style standing beside the road. Approaching it, I recognized the old miner, though his flowing white beard was now neatly trimmed a la Van Dyke, and his battered Stetson had given way to one with a pretentious brim and neatly creased top. He recognized me at once and extended a cordial hand which had lost little of its grip. We chatted a while, and I finally asked him if his mine worked out as a result of his inspiration on the summit.

"Son," he said, "this outfit is mine. I'm payin' that driver by the month an' I've got a diggins on Blank avenue, with two wranglers an' a cook. Some day I'm goin' back on them mountains to see if I kin git another idee how to spend some o' the money I'm gettin' from that mine."

CLIFF DWELLINGS, CHERRY CREEK, SIERRA ANCHA, APACHE TRAIL, ARIZONA

The great Southwest adds the lure of mystery, antiquity and romance to her scenic attractions. The remaining ruins of three distinct races are scattered throughout central Arizona. The Cliff Dwellings in the Cherry Creek Canyon country in the vicinity of Roosevelt are amongst the finest in the United States, and have attracted many noted archaeologists.

Why do not more people take the soul cure in the mountains?

Perhaps it is because they do not believe in it or do not approach the mountains in the spirit of appreciation. It is as necessary that one be in a receptive frame of mind in traveling on the top of the world as elsewhere, to get the benefits from association and contemplation. The chances are, however, that comparatively few know what they are, where they are, or where to get to them. If our National Parks were within the borders of an European country, their glories would be emblazoned upon the waiting-room walls of every railroad station on the continent, and many in this country; for, in Europe, they have learned that scenery is a natural resource, like many other of nature's products.

It might further be stated that the several hundred millions of dollars which under normal conditions leave this country annually with the tourist travel to Europe, would very likely be doubled.

It is true that many go to Europe to acquaint themselves with the habits and customs of a foreign people; but not all that go there. Nor is this the cause of so few visiting our own unequalled scenery.

Most people simply do not know what we have here How many have heard of Sequoia National Park, with the bluest sheet of water in the world nestling in the great crater of an extinct volcano, or of Mesa Verde National Park, with its canyons and mysterious cliff dwellings, each one an elixir of life for a sinking spirit?

THE SPIRIT OF A LONG GONE AGE STILL INVESTS THIS SPOT WITH BEAUTY AND ROMANCE

In Apache land, near Roosevelt, there is a canyon named Pueblo, which is a thousand feet deep or more. Near its source the gorge is so narrow that a stone can be thrown from one wall to another, and here the ancient Cliff Dwellers built their homes in great caverns that gave out on similar caves across the canyon. Among these crumbling ruins, which still speak strongly of the lives they sheltered, one feels most keenly the mystery of a race forgotten, long vanished from the earth.

We struggle for gain and advancement, and the success attained is generally at the expense of bodily health and spiritual vision. "What shall it profit a man, if he shall gain the whole world and lose his own soul?"

And yet, if there is merit in the contention that environment is a potent factor in man's development, how shall he save it from shrinking unless he sometime walks out of the sordid city streets into the open spaces where he can see and think in three dimensions?

If the body is afflicted with disease we may have recourse to the family physician; but if the soul is sick go to the mountain. He is a soul doctor. He will purge you with the sight of yawning chasms, lofty towering peaks and cliffs, and when your reeling senses have settled down to the correct realization of proportion and the relative importance of things, he will nurse you through spiritual convalescence with azure skies, sapphire lakes, scented forests, mountain meadows, tumbling cascades, and the health-giving ozone that God gave, to be breathed by man created in His image.

STATISTICS compiled by the National Lumber Manufacturers' Association show that during the 12 months ending July 31 the mills reporting cut 15,602,000,000 feet of lumber and shipped 15,741,000,000 feet, or 8.9 per cent more than production. Shipments for the first seven months of this year were 7.7 per cent more than last year, with no increase in cut. During July of this year 732 mills in all parts of the country and operating in all kinds of timber, cut 1,339,000,000 feet and shipped 1,566,000,000 feet, or 12.7 per cent more than production. The cut in July this year was 1.3 per cent less than July last year, with shipments 19.6 per cent greater.

AFTER generations of protection from the ax of woodsmen, thirty-five acres of fine old oak trees near Whig Lane, New Jersey, have been dedicated to the building of the Government's Emergency Fleet. Many of the trees reach a height of 60 to 70 feet and they are supposed to be from 150 to 200 years of age. The land on which they grow has been in the Richman family since the early settlement of Western New Jersey. It was only with the need of the United States for timber for shipbuilding that the consent of the family was obtained for cutting the trees. The largest oaks are cut into big beams and material for keels. A yield of 2,000,000 feet of lumber is expected.

THE NUTHATCHES AND THE CHICKADEES

(Families Sittidae and Paridae)

BY A. A. ALLEN, PH.D.

Assistant Professor of Ornithology, Cornell University.

CLOSELY related and formerly placed in one family (*Paridae*), the nuthatches and the chickadees are associated in more than name, for after the nesting season, they gather in loose flocks and spend the cold winter months together. Seeming to enjoy their company, other winter birds often follow them, so that when one hears the *yank-yank* of the nuthatch and the scolding *chick-a-dee-dee* of the chickadee, he may look also for the slender brown creeper winding its way up the bole of the tree, the downy and hairy woodpeckers, the golden-crowned kinglet, and often for a merry troop of tree sparrows. Not only are they sociable among themselves, but for mankind they seem to have little fear, and gather about suburban dwellings wherever food is offered them. Except in northern Canada, most species are non-migratory and spend the winter in the vicinity of their summer homes. If one wishes to have them about the garden all through the winter, he should begin putting out sunflower seed and pieces of suet, as directed in AMERICAN FORESTRY, December, 1915, in October or November, because it is at this time that their numbers are increased by the visitors from the North, and where they find an abundant food supply they are apt to remain all through the winter. When one has been feeding the birds for several seasons, there is every reason to believe that the same birds return year after year to the same feeding stations, just as it is known that they return to the same nesting spots. Members of the American Bird Banding Association, as reported by the secretary, Mr. H. H. Cleaves, have placed bands on the legs of several species of birds trapped at feeding stations during winter, and have recaptured the same birds in the same traps the following winter. The author has placed bands upon the legs of chickadees and nuthatches coming to his window during the winter and has had the same birds nesting in the vicinity the following spring and bringing their young for food to the same window the following fall.

The garden in which sunflowers have been planted will do more than anything else to attract the nuthatches and chickadees because both are more fond of these seeds than anything else. The sunflowers can be left standing or the seed can be used at the window shelf with equal effectiveness. The oils in the sunflower seed and the fat of the suet seem to take the place of insects, for both birds are insectivorous, and when not actually at the feeding shelf spend their time gleaning about the trees for hibernating larvae and insect eggs. During the summer they feed almost altogether upon insects and it is, therefore, very much worth while to expend the little effort necessary to entice them to the home grounds.

A WINTER CHICKADEE

If you'd like to have them stay with you all winter, just provide plenty of seed and suet, for snow and ice hold no terrors for this winter sprite, but food must be provided.

There are 241 species in the chickadee family, found in most parts of the world except South America and the Pacific Islands, but most abundant in the northern hemisphere. In North America there are but fifteen species represented, extending southward into the mountains of Mexico. Of these, six species are known as chickadees, four as titmice, three as bush-tits, one as a wren-tit, and one as a verdin, but all are alike in being small fluffy birds with long tails and sharp, pointed bills. The chickadees are dull grayish birds, lighter below, with conspicuous black crowns and throat patches. The Hud-

sonian chickadees, of the Far North and the mountains of Northern United States, which come southward in winter irregularly, have the top of the head brown rather than black, and the mountain chickadees of the Rocky

"IN UNION THERE IS STRENGTH." MORE POWER TO 'EM!

Chickadees and nuthatches are associated in more than name. After the nesting season they assemble in loose companies and make common war upon hibernating insects—and here they are, hard at it.

Mountain region have a white stripe over the eye, but all six species are easily recognized by anyone familiar with the common chickadee. In fact, the Carolina chickadee, of the Southern States, is so similar in appearance to the common chickadee that it can scarcely be distinguished from it in the field. The songs and call-notes of the different species vary considerably but all have a common likeness. The scolding call of the common species gives the name to the family, for it is a clearly enunciated *chick-a-dee* or *chick-a-dee-dee*. In other species it is less clear, more highly pitched, or more nasal. In addition to this note, the chickadee has a song of two or three sweet whistles resembling the syllables *phe-be* or *phe-be-be*, so exactly that amateur bird students are often led to believe that it is a phoebe calling. Also, as the chickadees troop through the woods, they have a variety of conversational notes rather difficult to describe. When protecting its eggs or young, the chickadee utters a hissing or sputtering sound, if disturbed, which is sufficient to discourage any unsophisticated squirrel from further investigation of the contents of the hole.

During March and April the flocks break up and pairs of chickadees can be seen prying about decaying stubs or old woodpecker holes looking for a place to build their nests. Even though their small bills do not seem adapted to chiseling, they usually find a stub sufficiently decayed for them to excavate their own cavities. During recent years, however, they have come more and more to accept bird houses such as those built for wrens. At the bottom of the cavity they build a warm nest of vegetable fibers, moss, plant down, wool, etc., and lay often as many as nine tiny speckled eggs. What is more remarkable, they often succeed in rearing all nine youngsters.

In spite of the fact that they begin selecting their nesting site in March or April, the eggs are not laid until May, but the young are out of the nest early in June, giving them time for another brood, which, however, is usually smaller than the first.

The chickadees are friendly, inquisitive birds and it is not only at the winter feeding stations that they become

BRACELETS FOR BIRDS

Aluminum bands, such as this one on the leg of the nuthatch, are proving that some birds winter in the same spot every year as well as that they return to the same place to nest. Likewise, they have shown that in most places chickadees and nuthatches do not migrate.

tame. They are always ready to answer an imitation of their *phe-be* call and will come flying through the woods to greet the traveler, perching on the branches above his head, sometimes even dropping to his shoulder or hover-

ing a few inches in front of his face in a vain endeavor to discover the whereabouts of the other chickadee.

The titmice, as the name is now restricted, differ from the chickadees in having the crown feathers elongated in the form of a crest. The tufted titmouse of the East and the plain titmouse of California and Oregon are the best known species, the other two being Mexican, and coming into the United States only in Texas and Arizona. The tufted and the plain titmice are uniformly gray, a trifle larger than the chickadees, but with the same cute ways of flitting about the outer branches, hanging upside down, peering under leaves, and examining the crevices of the bark. The loud whistled call of the tufted titmouse, *peto-peto-peto*, is one of the familiar sounds of the southern woodlands, while the *tu-whit, tu-whit, tu-whit*, of the plain titmouse is always associated with the live oaks of California.

WILL IT DO?
A prospective tenant inspecting a nesting box. He seems to be somewhat in doubt.

HIDDEN TREASURES
Inside the knot-hole are seven young nuthatches, jealously guarded by the mother.

HE LIKES SUET
Some good friend has remembered that this is the favorite dish of the red-breasted nuthatch.

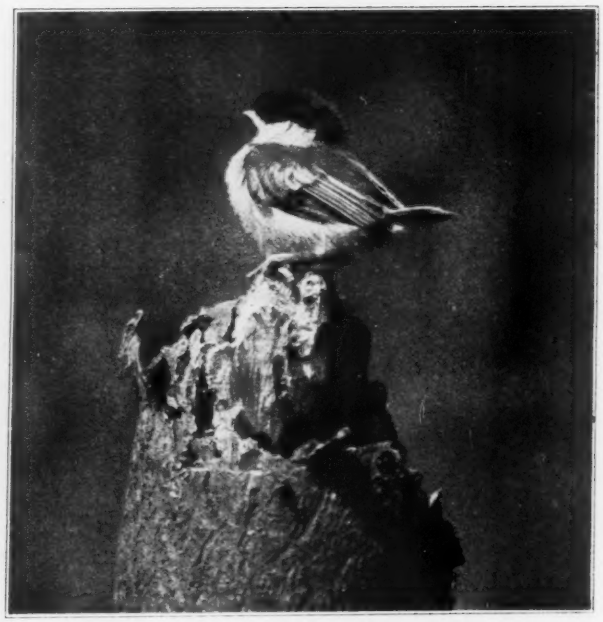
The wren-tits and the bush-tits are browner birds than the chickadees, the wren-tit being more or less wrenlike in its brown garb and its habit of holding its tail tilted upwards. The bush-tits are mere sprites of bird life, over half of their length of four inches being tail, so that their bodies seem scarcely larger than the end of one's thumb. In habits they resemble the chickadees with the exception that they build long purse-like nests of soft materials, hanging them usually in thickets of ash and willow.

The verdin is quite similar to the bush-tit in size and habits, but its whole head, neck and chest are bright yellow. It lives in the mesquite valleys of the Rio Grande, the Colorado, the Gila and the Pecos Rivers of the Southwest where, from the thorny bushes, it scolds and sputters at every intruder.

Like the chickadees, the nuthatches are largely confined to the Northern Hemisphere. There are about seventy species, of which only four are found in North America. They are bluish-gray birds, brighter than the chickadees, with white or rusty underparts, and with the top of the head brown or black. The chief characteristic of the nuthatches is their habit of climbing the trunk and larger branches of trees in search of insects, upward or downward with equal facility. Unlike the woodpeckers, they do not use the tail as a prop, nor are their feet arranged with two toes forward and two backward. Instead they have the ordinary perching type of foot with three toes forward and one backward. Both the toes and claws, however, are, of necessity, much better developed than in ordinary perching birds. Certainly they seem to have no difficulty in spiralling about the trunks of trees and, in fact, they have been known to sleep hanging head downward, clinging to the bark beneath a jutting limb. They are lively little creatures, always on the move, peering at one from strange angles, and their contented *yank-yank* adds much to the cheerfulness of the northern winter. The name nuthatch is supposed to be a corruption of *nut-hack*, derived from their universal habit of wedging the bark and then hacking them open. The white-breasted

A CAREWORN MOTHER

There are nine young hopefuls inside this hollow stump, and they demand so much attention that they allow her little rest.



A PERKY MEMBER OF A FAMILY OF NINE

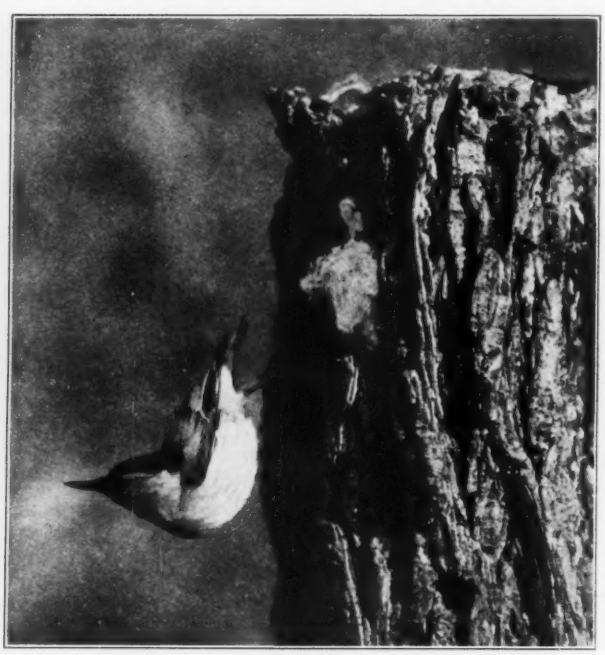
There is no danger of race suicide among chickadees, for large families are the rule, and this one looks fully able to paddle his own canoe.

nuthatch is the commonest species and is found throughout United States and Canada from the Gulf States to Central Ontario, preferring open woodlands, roadsides and gardens. It is pure white beneath, except for the under tail coverts which are reddish brown, and bluish-gray above, the top of the head and neck being shining black. In the female the black is more or less veiled with gray.

The red-breasted nuthatch nests only in the northern part of its range from northern United States to Alaska, but, in winter, it wanders as far south as the Gulf States. It is somewhat smaller than the white-breasted species, having the entire underparts, except the throat, rusty, and having a white stripe over the eye. It has a partiality for pine trees but, like its white-breasted cousin, it comes freely to the window for suet and sun-

PLANT SUNFLOWERS IF YOU WOULD ATTRACT THE FRIENDLY CHICKADEE

The chickadee is very fond of the seed and the flowers may be left standing, or the seed removed for use at the window feeding-shelf.



AN UPSIDE-DOWN NUTHATCH

Nuthatches travel upward and downward with equal facility and never use the tack as a brace, as do the woodpeckers.

CHICKADEES ALWAYS SHOW THEIR APPRECIATION

"Give us a hand for friendship's sake"—and feed the birds this winter. You'll be well repaid for your trouble.

flower seed. Its notes are very similar but higher pitched and more nasal like the syllables, *yna-yna*.

The brown-headed nuthatch is confined to the southeastern United States from Delaware and Missouri to Florida, frequenting the extensive pine forests. It is smaller even than the red-breasted species, and its notes are different from either of the preceding, a conversational *pit-pit* and a scolding *dee-dee-dee*, being the most familiar.

Similar in appearance and habits but still smaller, measuring sometimes less than four inches in length, is the pigmy nuthatch of the Rocky Mountains.

The nesting habits of the North American nuthatches are much alike. They usually select a knot hole in the trunk of a tree, occasionally a woodpecker's hole, and line it with feathers, leaves, wool, etc. They lay from four to nine white eggs, which, differing from the majority of hole-nesting species, are heavily marked with brown. The common European nuthatch has the curious habit of plastering up the entrance to its nest with mud until the opening is just the right size, and the American red-breasted nuthatch usually decorates the entrance with nodules of pitch as if to make the entrance less attractive to squirrels and other enemies.

A TRAIL MARKER

BY LENA B. HUNZICKER

AT Old Town, San Diego, California, at the foot of Presidio Hill, stands a venerable palm tree, the Plymouth Rock of the Pacific Coast, the oldest living object to tell the story of the coming of the Spanish to Upper California in 1769.

The seed from which this remarkable old tree grew was brought with the provisions and supplies of the Spanish expedition and is said to have been planted by Padre Junipero Serra in 1769. Until some five years ago two palms of this first planting were still growing.

It is said that the only time the trees bore fruit was

THE "PLYMOUTH ROCK" OF THE PACIFIC COAST

The palm at Old Town, San Diego, California, a landmark and still beautiful, said to have been planted by Padre Junipero Serra in 1769.

in 1869, one hundred years after their planting. Fronting a public highway they became much scarred, until in 1887 they were enclosed in a fence to protect them from further injury. A severe windstorm some five years ago so badly damaged the smaller one that it had to be cut down. A portion of the old trunk has been placed in the museum at Ramon's Marriage Place, at Old Town. The other tree has been braced and bids fair to live many more years.

HARRY C. HYATT, city forester for Cleveland, Ohio, warns the people of Cleveland that constant vigilance is necessary for successful tree culture in a congested city. His department has the care of more than 125,000 street trees and the trees in over 2500 acres of parks.

A QUAINT BIT OF SENTIMENT

BY GAYNE T. K. NORTON

UP in the woods near Tuckahoe, N. Y., are two saplings, growing side by side, tall and straight. About eight feet from the ground they are joined, and in that joining lurks a bit of mythology and sentiment, for it is a true lover's knot, unknown and unnoticed by many who tread the path below.

It was the custom in old Arcady for a man and a maid upon their betrothal to go alone into the woods. There, two very young saplings, growing side by side with branches intermingled, were selected and in some way fastened together, by grafting, tying or splicing, so as the years passed, they would become as one. If the trees grew tall and straight above the knot all would be well in the lives of the couple; but woe to the unhappy pair did they grow apart. Great care was used in the selection, to see that no other tree would interfere with growth, and saplings sheltered from storms were sought for; and, once chosen, the young trees were carefully tended and watched. So the legend ran.

We, my companion and I who had found and photographed the knot, walked on, aglow with imagining the story it held, noticing not at all the chill of the January afternoon. A bit further on was a lad of eight, in sweater and rubber boots, brown and healthy, "discovering" his whistle.

A "TRUE LOVER'S KNOT" NEAR TUCKAHOE, NEW YORK

By an old custom a newly betrothed couple spliced two growing saplings together so they would become one. Such splicing caused the growth shown in this picture.

Making ourselves heard we asked where a spring might be found. He led us to his home, showing the way to two chairs before a crackling log fire in a cozy New England kitchen. Behind us bustled a fat and smiling, middle-aged, motherly person, who, paying no heed to our protestations, set before us two steaming mugs of coffee, with sugar and cream—not the doctored, delicatessen kind, either—and a heaping plate of doughnuts, the specie with the hole in the middle. She talked while we ate; and what a treat it was! Then her husband came in, a big, strapping fellow in boots and furs, who bayed a welcome that made the tea-kettle cover vibrate. The motherly person brought him slippers and pipe, seated herself and knitting at his side (she was doing socks for Canadian "boys" at the front) while "Tow Head," as he called our young guide, climbed to his lap. For minutes we listened to the fire, perfectly happy as the pipe smoke curled and the doughnuts settled. Then our host startled us.

"I expect you chaps are wondering about 'the knot?'" A contagious chuckle rumbled out as he noted the surprise. "I'm a bit of a woodsman," he explained, "and I saw you without bein' seen."

"May we have the story?" my companion asked.

The big fellow settled comfortably. His wife smiled happily, edging closer. "Tow Head" yawned.

"'Tain't much of a story," he began, "but here it is. You see my Granddad and Dad both lived long and happily up in Canada. They were both married over the 'knots' they'd tied, and swore by them. 'Twas only natural I should believe in the custom, too. So when I came down here — South, we call it — I brought it with me and when we became engaged," here he simply took the ready hand of his wife, "why we 'tied a knot.' That's longer ago than my wife cares to remember, so we'll forget the date. The end of the tale you see. The trees grew straight, that's all."

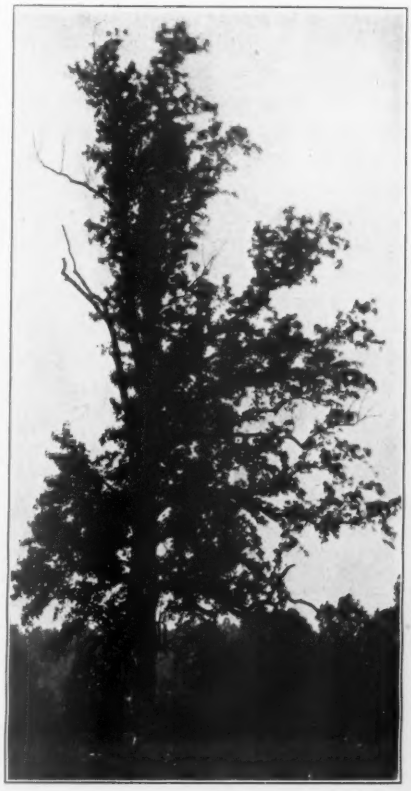
To give his name would be a sacrilege, but the knot-bound trees are there, by a path in the Tuckahoe woods, and the New England kitchen is not far distant.

IN BUILDING the government fleet of standardized wooden ships one item is the use of creosote to prevent decay of exposed surfaces. The instructions to district officers of the Emergency Fleet Corporation provide that during the building of the hulls of these ships the joined surfaces of timbers and planking shall be treated with a coal tar distillate of the physical and mechanical characteristics required by the specifications for the brush treatment of poles adopted by the National Electric Light Association.

FLOWERS, FEATHERS AND FINS

BY R. W. SHUFELDT, M. D., C.M.Z.S.

SOME of the handsomest and most showy flowers we have in our flora are not those that blossom on plants in the meadows, fields and marshes, but are to be seen, as spring opens, on some of the grandest trees of the forests. A conspicuous example of this is to be noted in the tulip tree.



THIS OLD TULIP TREE COULD TELL AN INTERESTING STORY

Fig. 1—Under certain favorable conditions, the Yellow Poplar or Tulip-tree (*Liriodendron tulipifera*) may come to be of a great age, attaining a height of an hundred feet or more. The one here shown is considerably higher than that, and it may be a century old. It is on a hill south of the National Zoological Park, Washington, D. C., and it is now on the decline.

Few there are among us who give any thought to the ancestry of trees, that is, to the evolution of trees in time — geologic time. For example, it is now known that our present-day tulip-tree is, as a species, the last of an extinct type which, ages upon ages ago, was extremely abundant. There are some seventeen species of tulip-trees, all extinct, in the Cretaceous formation alone. They have been discovered in Kansas, New Jersey, Wyoming and Nebraska, while other fossils of them have come from Greenland and Bohemia. Still other types have been discovered, mostly in Europe, in the Tertiary formation. The flowers of the tulip-tree are well known, as they are large and very showy.

Throughout the Middle Atlantic States we have, in suitable localities, some shrubs and plants that do not flower until far into the autumn months. Some of these have already been figured and described in AMERICAN FORESTRY, while others were set aside to have attention drawn to them here. Among the shrubs there is the well-known and favorite sassafras and its beautiful berries, or what might better be designated as its fruit. It has been described as *Sassafras veriifolium*, likewise as *S. officinale*, and it is the only species known to the botanist, occurring, as it does, principally east of the Mississippi and southward; it is also found in southern Canada. As all know, its bark and roots are aromatic; and not only are its leaves green, but also its bud-scales, flowers and its small branches and twigs. One of the most curious things about this sassafras tree is, however, the form of its leaves; they are dimorphous—that is, the earlier ones are oval in outline and entire, while those coming out later are irregular in outline and three-lobed. In Australia there are other shrubs called sassafras, but they do not belong in the same group as our United States form. Still other shrubs bear the same name in South America, and some of these are magnolias.

Passing to the more humble plants of the fall months, there is a very interesting one in the Turtle-head, also known as the Shell-flower and Cone-head in some localities. It is found growing along streams and on the edges of big swamps and marshes. Sometimes you will run across a fine plant of this species, doing beautifully among the rank vegetation springing up in an old ditch containing clear water. It occurs almost anywhere east of the Mississippi, flowering from July to September, according to locality. The plant is rarely seen north of Newfoundland, and it is not especially abundant anywhere. Regarded upon side view, one of the flowers rather reminds one of the head of a small turtle with its mouth open. Big bees, in serving it, have a hard time squeezing in past the pseudo lips of the matured blossom. Once inside, however, the insect's movements are communicated to the whole flower, while the former is entirely out of view. The "head" and "jaws" now seem to simulate those of a masticating turtle—in fact, an eyeless, white-headed turtle, tinged with

A GLANCE AT THESE FLOWERS WILL EXPLAIN WHY THIS PLANT IS CALLED TURTLE HEAD

Fig. 2—There are three species of this Turtle Head (*Chelone glabra*), also called Snake Head and Balmony, and all, with the exception of *C. lyoni* of the South, are prone to grow in wet and damp places. The flowers of this Turtle Head are white, tinged with rosy pink; while in Lyon's Turtle Head the corolla is of a rich purple, with a decidedly rosy hue

FEW TREES BEAR HANDSOMER FRUIT THAN THE COMMON SASSAFRAS (*Sassafras variifolium*).

Fig. 3.—This tree has been placed in the Laurel family (*Lauraceae*). The ovoid drupe or fruit of the Sassafras is at first a bright green or yellowish green; it then turns a deep bluish or purplish black, and has the form which is so well shown in the cut The pedicels are of a reddish flesh color, cupped at their extremities. The early French settlers in Florida gave this tree its name, and it is generally found growing on the limits of rich woods.

IRONWEED IS ONE OF THE GLORIES OF THE FLOWER WORLD IN AUTUMN

Fig. 5—This plant is also known as Flat Top (*Vernonia noveboracensis*), and it is a member of the *Compositae*. Its flowers are of a rich purple, and some thirty or forty of them make up a head. Sometimes it grows to be six feet high, and is then very conspicuous in the old fields and damp places.

pale pink, deliberately chewing and chewing a bumble-bee. The resemblance, which may last for an entire minute, is quite ludicrous.

The one who gave the vernacular name of "Elephant's foot" to the plant of that name must have been endowed with an unusually keen imagination—in fact, with a far-fetched faculty of seeing resemblances in forms as utterly unlike in every particular as those of a tea kettle and a crooked pin

Elephant's foot is easily recognized either by its flowers or by the triangle of leaves or bracts that encircle them at their bases. Each head of this plant is composed of a cluster of several flowers. It blooms rather late in the season, and is generally found in dry places in the open woods—sometimes in great masses extending over from ten to twenty square feet. The thin, ovate-oblong leaves are somewhat hairy, and the plant is a perennial—that is, it appears year after year in the same localities.

When the autumn days come around, the flower world is represented by some very distinctive and conspicuous plants in the entire northeastern section of the United States. Some of these bear a certain resemblance to each other—at least some people seem to think so—such as the Iron-weed, the Joe-Pye weed, and the larger species of the purple asters. At the same time of the year, and pretty much in the same places—that is, in old fields and along country roadsides—are also seen in all their glory, several species of thistles; the milkweeds all in pods; the boneset, black-eyed Susan, and everywhere the coming goldenrods of several kinds. Of all these none is richer in color, or more conspicuous in size and massing than the elegant Iron-weed or Flat-top. Many species of big butterflies are now in evidence, and the well-known tiger swallowtail seems to be partial in its attentions to the flowers of this well-known plant. The one shown in the illustration, however, is a Viceroy butterfly, seen on side view (*Basiliarchia archippus*); it does not show up very well for the reason that it lit within the shadows of the flowers and upper leaves of the plants. The former are tubular and the latter are alternate, nearly lanceolate, and have finely serrated margins, being withal very rough on both surfaces. *Vernonia* has its name from William Vernon, an English botanist of long ago, who, at one time, botanized in this country.

THIS IS ELEPHANT'S FOOT (*Elephantopus*), AN INTERESTING PLANT THAT BELONGS IN THE GREAT COMPOSITE FAMILY (*Compositae*)

Fig. 4—Three species of Elephant's Foot have been described, the one here shown being *E. carolinianus*,—a plant growing in dry soil from Pennsylvania to the Lakes and southward. The flowers, well shown here, are of a purplish color.

Passing to the thistles, this is a numerous and a sometimes puzzling group of plants, though not quite as much so as the goldenrods or the asters. Our common burdock is more or less nearly related to any typical thistle; and the bur of a burdock, when the purplish flower-head appears, quite closely resembles the corresponding parts in a thistle. The thistle shown in Figure 6 is one of our most abundant species; it is widely known as the Common or Bull Thistle. Its flowers are reddish purple, passing almost to a pink shade in some plants. In still other thistles they may be white, or even of a yellow tint. As in the case of so many other undesirable plants, the majority of our thistles found their way over from Europe.

"When the Danes invaded Scotland," says Neltje Blanchan, "they stole

a silent march upon the Scottish camp by marching barefoot; but a Dane inadvertently stepped on a thistle and his sudden, sharp cry, arousing the sleeping Scots, saved them and their country; hence the Scotch emblem."

Thistle flowers are most attractive to some species of big bumblebees; but they pay well for their over-indulgence in their sweets. The latter are very abundant and unusually fragrant, so that these flowers are great honey producers of the finest quality. This induces the bumblebees to partake unduly of the generous supply so readily secured at each visit, and a species of intoxication is speedily produced in them, greatly interfering with their locomotory powers, as well as with their power to fly.

The largest thistle we have in our flora is probably the Pasture or Bull Thistle (*Cirsium pumilum*), while among the smaller stands the Canada Thistle (*C. arvense*). Then, as stated before, many others belong to several genera, including the Milk Thistle, the Star Thistles, the Cotton or Scotch Thistle, and the rare Blessed Thistle (*Cnicus benedictus*).

A SPIDER THAT WEAVES A MAT TO REST UPON IN IDLE MOMENTS

Fig. 7—This is the common Garden Spider (*Argiope*) so familiar to everyone living in the country where it occurs. Moreover, it is also to be found in city gardens, which was the case with the one here shown in the cut. Note the curious zigzag web it has woven down from its central resting place.

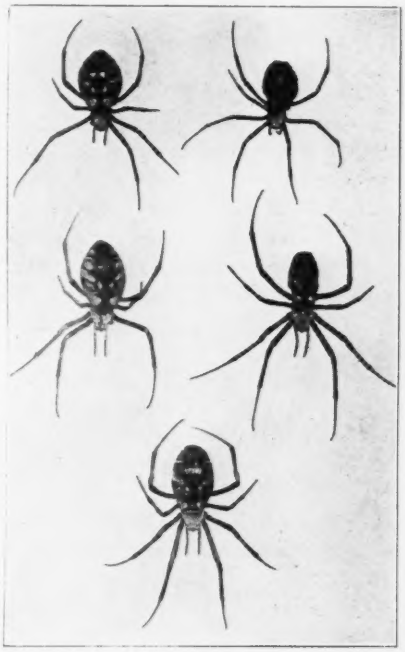
Almost without exception, all these plants have been introduced into this country from Europe. The study of the seeds of thistles and the fertilization of the flowers is an extremely interesting story; but it is too long to touch upon in the present connection.

In old fields and along the roadsides throughout the autumn months, when we find the various plants enumerated in the foregoing paragraphs, we will be sure to meet with the widely known garden spider. It also constructs its interesting web in our gardens, and sometimes among the shrubbery of the big city parks, as in Central Park in New York City, and in similar localities throughout eastern United States. When a field covers many acres and becomes overgrown with rank vegetation of many kinds, you will sometimes find this beautiful spider in hundreds, their webs being built as shown in Figure 7. Some of the old ones are much larger than the one here shown—so large, indeed, that their webs will hold a cicada, or the humming insect which most people call a locust. We will also find katydids and big grasshoppers in the strong, silken strands forming the web of this famous black and yellow arachnid; for spiders belong to the *Arachnedia* and are not insects at all. If the spider's captive has been recently caught, it may be in its death struggle, with its cold-blooded captor deliberately finishing his victim and applying the first layer of silken wrappings to his body and wings; while, if dead and partly used up, the silken envelope will be very complete and dense, fitting the entire body and wings and limbs of the unfortunate insect with the greatest accuracy and snugness. It is a terrible death, when one comes to think of it, for all such insects can both realize and appreciate the hopeless predicament they are in; moreover, they do suffer real pain.

There is some difference in size of the male and female garden spiders, and they also vary in this particular according to age. Sometimes you will

THIS PARTICULAR THISTLE IS CALLED LANCEOLATUM FROM THE SHAPE OF ITS LEAVES

Fig. 6—There are about a dozen different species of thistles in our flora, and no one of them is better known or more heartily detested by the farmer than the one here shown. Gray calls it the Common or Bull Thistle (*Cirsium lanceolatum*). Its purple flowers are very conspicuous in the fields and along the roadsides, from midsummer until late in the autumn.



VARIATIONS IN THE FORM OF COMMON GARDEN SPIDER

Fig. 8—These five specimens were collected near Great Falls, Maryland, in an old, deserted field having an area of some fifteen acres. It was in mid-autumn, and many plants and grasses flourished there—chiefly Milkweeds, Pokeberry, Boneset, both blue and white; Black-eyed Susans, Joe-Pye Weed, and a great many others.

come across a bouncing, big male—larger than any of those shown in Figure 8. When on their webs, this species always rests with its head toward the ground. It will be noted that the yellow or pale orange markings on different individuals vary a little, while being, invariably, after the same general pattern. You may collect thousands of garden spiders; and, in so far as color-pattern goes, you will not meet with any greater variation than is here shown in Figure 8. Ernest Ingersoll, in his work "The Animal World," says that this species of spider has a "white cross upon its back." In this he is surely incorrect, and must have had at hand some other species when he wrote his account of "The Garden Spider." He does not even refer to the chief distinguishing character of the garden spider's web—the peculiar zig-zag, dense sort of pathway it spins above and below its central mat or resting place (Fig. 7). The true use of this has not as yet been made out; it appears to be simply added to the web, in many instances, for the purpose of adornment. A close relative of the garden spider is shown in Figure 7; probably both species built a nest quite like the one shown in Figure 10.

HERE WE HAVE A RELATIVE OF THE COMMON GARDEN SPIDER

Fig. 9—Mr. Nathan Banks examined the specimens shown in this cut, and he said of them that "These spiders are the *Argiope trifasciata*, Forsk., both females. They are commonly called the 'Silver ladder spider.' The species is fairly common in the Eastern States from Massachusetts south to Florida, and into the West Indies and Central America." To this we may add that they were collected at Bradley Hills, near Washington, D. C., being found on a head of a common Golden Rod.

Spiders form an enormous group in the animal world, and many thousands of species have been described; doubtless a legion of them are still to be discovered by naturalists. How many have become utterly extinct in geologic time we can never know—probably many times the number, with respect to species, now represented in the world's existing arachnine fauna. Men have lived who have devoted their entire lives to the study of spiders, their researches occupying many hours every day of the week. In a few instances of this kind, only a few genera have thus been studied and worked up. In these war times such devotion is extremely rare.

It is a long span from spiders to owls, and in making it we pass over a great many thousands of animal forms—vertebrate as well as invertebrate. One would be surprised when told of the number of species and subspecies of owls we have in the avifauna of the United States; perhaps not one person in a good many thousand, as people go, would guess anywhere near the correct number. When the American Ornithologists' Union published its "Abridged Check-List of North American Birds" in 1910, no fewer than forty-four different kinds of these birds occurred in North America, north of the Mexican boundary. Some of the species are very large and handsome, while some of the little pygmy owls are no bigger than a sparrow—beautifuliy plumaged and having very interesting life histories. Our Saw-whet owls are considerably larger than these, but none the less worthy of admiration and study. In Figure 11 of the present article we have a reproduction of a life photograph of the Saw-whet of the East. Early in the last century this species was quite abundant throughout the Middle and New England States, while at the present writing the bird is comparatively rare. This little fellow is quite nocturnal in its habits; in fact, so poor is its eyesight in the daytime that there are many instances on record where it has been caught by the hand when found perching somewhere in the bright sunlight. The darker part of the plumage is of a rather deep ashy brown, and the lighter part a creamy white, tinged with ash, some of the head and tail markings being almost pure white. As is the case with nearly all owls, the female is fully an inch larger than the male, and measures about eight and a half inches in extreme length. All owls lay pure white eggs, noted for their unusual approach to sphericity; sometimes an owl's egg will be met with which is almost a perfect sphere. They are extremely useful birds with respect to man's interests, for they destroy on farms and in agricultural districts generally thousands upon thousands of field mice and field mice stand among the greatest grain consumers that the farmer has to deal with throughout the year. Some of our large species of owls may from time to time destroy poultry on the farm; but they are also the eternal enemies of many of the farm vermin and pests, while the smaller species of these valuable birds stand among the best friends the husbandman has upon his estates. They

GARDEN SPIDERS BUILD A ROUND AND DENSELY WOVEN NEST

Fig. 10—You will find these nests in the old fields and elsewhere in the autumn. Generally they are attached to the stems of the coarse grasses and other vegetation. A small opening is left at the top, while they are held in place by silken strands leading to the supports on all sides. The butterfly on the ground is a beautiful specimen of a male Buckeye (*Junonia coenia*), an abundant species in certain localities throughout the Southern States. They are very pugnacious and fight other species of butterflies.

should be protected in every way—even introduced, and encouraged to breed upon every grain farm in the country.

In studying various animals and living things in nature, one is often confronted with what has been aptly described by naturalists as cases of "protective resemblance." Some interesting instances of this are met with among owls, as for example in the "gray phase" of our common screech owl, which, when perched upon a mossy, dead limb of no great size, with its body drawn up in an elongated fashion, and with its feather-horns fully erect, closely resembles a dead and broken branch, and many a screech owl has owed its life to this remarkable resemblance. To study some of the most extraordinary examples of this protective resemblance, however, we should turn to the insect world. Cases are to be met with among insects in every quarter of the globe, and a very noteworthy one is to be seen in our common stick insect of the Eastern States. In Figure 12 one of these is shown reproduced from a photograph from life. It is extremely difficult to recognize one of these fellows among the small green twigs of the tree or plant upon which it may be resting, especially if it extends its fore-pair of limbs to the front, bringing them close together, as it often does. Its resemblance then to a small, green and leafless twig is almost perfect, and its enemies — or would-be tormentors and destroyers —almost invariably pass it by unnoticed.

THIS IS ONE OF THE MOST INTERESTING OF ALL THE SMALLER OWLS IN OUR AVIFAUNA.

Fig. 11—In the southwestern parts of the United States there are found various species of elf and pygmy owls that are little bits of fellows. The one here shown is considerably larger, and is an eastern species. It is called the Saw-whet, as its call sounds like the noise made when sharpening a saw.

In some of the books these insects are called "walking-sticks" from the deliberation of their movements and locomotion (*Phasmidae*). Belle Cragin says of them: "The insects have so strong a resemblance to brown and green twigs and stems that it takes a sharp eye to detect them when they are at rest. The body, legs, and antennae are long and slender. Our one common species has no wings, but the tropical species have wings that look precisely like leaves. They walk slowly and awkwardly. The middle pair of legs is the shortest. They feed on the leaves of trees and plants."

This protective resemblance occurs throughout nature but more especially in the animal world. It must not be confounded with "protective mimicry," which is quite a different thing. Then, some forms are capable of more or less suddenly changing the color of their skin, and by so doing match, to a greater or less extent, their surroundings, which at once render them far less easy to be seen by an enemy or other observer. A good example of this is to be noted in our common American chameleon of the Southern States (*Anolis principalis*). It possesses the power of assuming a variety of colors, ranging all the way from a deep snuff-brown to a pale pea-green —the desired change being accomplished with more or less celerity. This lizard often attains a length of seven or eight inches; and along the bayous in lower Louisiana, it is interesting to observe a big one cautiously creep down the dark trunk of a cypress tree, which latter has some of its roots extending into the waters of the bayou. Should one make a pass at this lizard with the intention of capturing it, and miss it, the fellow will dart down the trunk spirally as quick as a flash, and, quitting the tree, leap onto one of the stems of the pickerel weeds growing in the water. Then, cautiously creeping up on the further side of this, it rapidly changes, as it does so, to a shade of green which more or less closely matches that of the stem of the plant. The fact that the fellow quickly comes to a dead rest still further enhances its safety; for, being of a decidedly elongate form, from the tip of his nose to the end of his tail, he simulates the green, rod-like stem of the pickerel weed upon which he rests.

AMONG INSECTS THE WALKING STICKS PRESENT THE MOST REMARKABLE EXAMPLES OF PROTECTIVE RESEMBLANCE.

Fig. 12—The life history of our "stick insects" is wonderfully interesting, and there is considerable literature on the subject. Dr. L. O. Howard tells us that "in 1898 this insect appeared in extraordinary numbers in a black-walnut forest in western New York, so that in the autumn the dropping of the eggs on the leaf-covered earth sounded like a heavy shower of rain." The specimen here shown is of a bright green color.

Remarkable examples of protective mimicry are likewise to be seen among fishes, and no form presents a better exemplification of this than the peculiar little seahorse of the Australian seas (*Phyllopteryx*). Its body and fins, in color and otherwise, have come to be so modified that it, as a whole, looks like a crooked bit of stem of oceanic seaweed, with the delicate, slender and wavy branchlets floating from it. As it lives among the very

vegetal growths of the ocean which it closely resembles, the chances of being observed in its natural habitat are quite remote under any conditions, and it thus frequently escapes its enemies, should it have any that prey upon it. Most fishes, however, offer no such remarkable peculiarities; they are just plain fishes, like the common American Yellow Perch. This is a very handsome inhabitant of fresh-water ponds, lakes and streams, being extremely abundant in some sections. It is considered to be entirely typical of the true bony fishes in all particulars, with respect to its structure, and its skeleton has long been used as the type for the osseous fishes.

WOMEN HELP TO FIGHT FOREST FIRES

THREE Arizona women have received the official thanks of the Forest Service, in the form of a letter from the Acting Forester, for services rendered in fighting forest fires. They are Mrs. O. P. Schoenberg, of Portal, Arizona, and the Misses Lillian and Hildegarde Erickson, of Cochise, Arizona, who last June and July assisted forest rangers in suppressing serious fires which burned over about 24,000 acres in the Chiricahua division of the Coronado National Forest, in Arizona.

MISS LILLIAN ERICKSON.

MRS O. P. SCHOENBERG.

MISS HILDEGARDE ERICKSON.

At a time when all the available men were needed on the fire line, officials of the Forest Service say that Mrs. Schoenberg, who is the wife of Forest Ranger O. P. Schoenberg, took over the work of securing labor, handling the telephone exchange, and thus keeping the various crews in touch with each other, and running the commissary for the large force of laborers employed on the fire. She also arranged for the disposition of the men at the different fire-fighting crews and fed the newcomers on their way to the fire. It is stated that her excellent judgment and initiative were of material assistance in extinguishing the fire.

The Misses Erickson, daughters of a Forest Ranger, took an active part in the fire fighting. They organized and set to work one crew of men and aided in securing others. On one occasion, by actually fighting fire all night, they relieved a crew which was urgently needed at another fire. In addition they carried food and water to the men on the fire line, who otherwise would not have had anything to eat.

ELOQUENT testimony as to the value of proper care for trees in city parks is afforded by the statement of Park Commissioner Cunliff, of St. Louis, as to the decrease in tree mortality in Forest Park, in that city. Forest Park contains approximately 50,000 trees. The number of trees dying during the last twelve months was only 453. During a similar period four years ago the number of deaths was 1200. Last year it was 600. The lower death rate of the trees is attributed to improved methods of care and repairs applied during recent years. The trees removed will this fall be replaced by planting 10,000 saplings.

JOHN GORDON DORRANCE, first assistant forester of the Maryland State Board of Forestry, has entered the Engineer Officers' Reserve Corps of the United States Army, with a commission as second lieutenant. He is the first man to represent the forest engineers and professional foresters of Maryland in the forest regiments organized by the War Department. As a part of his training Mr. Dorrance studied in the Black Forest of Germany and at the University of Hesse-Darmstadt and Heidelberg. He holds the degrees of bachelor of forestry and forest engineer from Biltmore College of Forestry.

CONSERVATION IN AUTUMN LEAVES

IN the autumn tints of the woods there is no evidence that nature is practicing conservation in her use of coloring matter. The lavishness with which she has painted the landscape red, yellow and brown suggests to the layman that she is altogether reckless in her desire to make the country attractive and that she has a fine disregard for the war-time supply of pigments.

To the dendrologist the rich coloring tells a story of true conservation, and gives additional proof that nature never wastes her resources. The brilliant hues of the forests are a manifestation of a plan to use everything to the best possible advantage. The change in coloring which takes place in the leaves during the autumn is the result of chemical processes which are at work in nature's laboratory. It is a part of nature's preparation for winter. Science explains that during the spring and summer the leaves have served as factories for the making of the foods necessary for the growth of the trees. This process of manufacture takes place in numberless tiny cells of each leaf and is carried on by small green bodies which give the leaf its color. These are known as chlorophyll bodies. By taking carbon from the carbonic acid gas of the air and combining it with hydrogen, oxygen and various minerals supplied by the water gathered by the roots these bodies make the necessary food.

In the fall, when cool weather causes a slowing down of the vital processes the manufacturing ceases and the chlorophyll is broken up into the various substances of which it is composed and the food is sent to the body of the tree to be stored up for use in the spring. All that remains in the cell cavities of the leaf is a watery substance containing a few oil globules and crystals and a small number of yellow, strongly refractive bodies which give the leaves the yellow coloring so familiar during the months of the autumn. For the reds and browns sugar is responsible. When there is more sugar in the leaf than can readily be transferred back to the tree its chemical combination with the other substances produces various tints, ranging from the dogwood's red to the reddish brown of the oak.

The feeding of the tree itself is only a part of the duty of nature's chemical laboratory. The entire vegetable kingdom depends to a large extent on the food supply created by the leaves. Chlorophyll green is the only substance which has the power to break up rocks and convert them into starches and sugars. As the tree drinks in water from the soil the flow carries small particles of rock into the trunk of the tree. When the chlorophyll is returned to the parent stem by the leaves it works on these particles and through chemical reaction converts them into sugars and starches for sustaining the life of the tree. Nature's fine adjustment of things is evidenced in the circumstance that the chlorophyll all disappears from the leaf before the leaf falls and thus protects the surface rocks from any danger of disintegration such as might occur if the leaves which are deposited on them carried this chemical substance.

With the return to the tree of the food substances the leaves retain relatively large amounts of nitrogen and phosphorus which were originally a part of the soil. Through decomposition the fallen leaves enrich the soil and it is because of this and the accumulation of humus that the black earth of the forest floor is so fertile. For this reason the burning of leaves on the forest floor robs the soil of much of its fertility.

A BEAUTIFUL "MONKEY-POD" IN HONOLULU.

By an official order given by ex-Governor Sanford B. Dole, this tree was left standing in its original place when the street was improved.

TREE SAVED BY A GOVERNOR

BY ALLEN H. WRIGHT

WHEREVER one may go, he will always find something of interest in connection with the trees which may grow there.

In the city of Honolulu, Hawaiian Islands, for instance, one will see in Vineyard street a beautiful specimen of the monkey-pod tree, standing squarely in the center of the thoroughfare, its great branches extending far over the property-line on either side of the street.

The interesting story about this tree is that former Governor Sanford B. Dole, who was at one time the president of the short-lived republic which followed the end of the rule by native kings and queens, gave an official order that this tree should be left standing when the street was improved, and so it stands today unharmed, beautiful in its natural spread of branch and shade, acting as a guide for autoist or driver to keep to the right side of the highway.

URBAN AND SUBURBAN FOOD PRODUCTION---ITS PAST AND ITS FUTURE

BY CHARLES LATHROP PACK

President of the National Emergency Food Garden Commission and President of the American Forestry Association.

THIS is the time for stock taking in connection with the food situation. We have had a growing season which broke all records and was generally beyond expectations. The work of gardening, of canning and of drying vegetables and fruits has been under way in the land, from Maine to California, and from the Lakes to the Gulf, and has justified all belief as to success. It is important to consider what this means. It means one million one hundred and fifty thousand acres of city and town land under cultivation the past season for the first time. Urban and suburban America became a vast garden as the result of the impulse given to the nation by the National Emergency Food Garden Commission. This area of productiveness embraced back yards, vacant lots and hitherto untilled tracts of land in and around nearly every city, town and village. Our nation-wide survey located nearly three million such gardens. This is only a beginning. What shall the harvest be next year? What have we learned this year?

Germany reports that its town war gardens produced more in 1917 than any year since the war started. This shows the value of experience. In our one year of experience, it is conservative to state, that by the planting of gardens the nation's food supply has been increased to the extent of more than $350,000,000. Next year we will do even better. We will then have more war gardens and the average production will be larger. With a better knowledge there will be fewer failures.

Any inventory of the food situation must reckon this great garden fruitfulness as a vital factor. As its first duty, already accomplished, it has been of great value in keeping down the cost of living for the people of America. Household expenses have been bad enough as it is. That they would have been far worse without this garden crop is obvious. There is much evidence that our food gardens are helping our people to feed themselves more reasonably. The editor of the North American Review, in the issue for September, 1917, says: "Last spring at garden planting time we urged the increase of production, partly through intensified culture, to increase the yield per acre, and partly through the increase of acreage by the cultivation of neglected fields and even small plots in suburban and urban areas. How well this policy was executed is seen in the report of the National Emergency Food Garden Commission that the gardens of the country were this year more than trebled in area. Beyond question, this garden achievement has much to do with the fact that the increase in price of garden products in the year was only 22 per cent, or less than one-fifth the increase in the price of breadstuffs."

The war gardens of America have been extensively referred to as a valuable economic agency by the newspapers of England, France, Italy and South America The significance of this planting does not end with the summer season. The war gardens will exert their influence on the cost of living during the winter months. Their value is a thing of the future as well as the past. Conservation has been practiced on a national scale. In the homes of America there has been earnest recognition of the importance of looking ahead. The individual citizen has realized that the over-supply of the growing season must be translated into terms of abundance for the winter. This realization has brought about such activity in household conservation as America has never before known. Food saving and food conserving are becoming national characteristics. From a wasteful nation America is being transformed into a nation alert to the needs of the future. The keynote of this new national spirit has been that nothing should be allowed to go to waste—that nothing useful should be thrown away.

The result will mean much for food F. O. B. the pantry shelves in the homes of America this winter and help us, by feeding ourselves, to feed our boys of the Army and Navy and to feed our Allies. Our soldiers must all be fed and the soldiers and civilians of France and England must be fed, and to a large extent fed by us, and we are going to see that this is done. The gardens of next year will exceed those of the past season. In the canning and drying of vegetables and fruit our women have been contributing their share. The canning and drying movement has brought back to thousands of American households an art almost forgotten since our grandmothers' day. This will be continued next year on an even larger scale.

War has made Uncle Sam the biggest buyer of food in this country. The board bill for his soldiers will soon be at least $1,000,000 a day. We are to have 2,300,000 or more men under arms shortly according to Secretary Baker. At forty cents a day food cost per man it will be seen what that means. True, these men ate before becoming soldiers to make the world safe for Democracy. Each of them doubtless ate more than forty cents' worth daily. But you must remember that these men have suddenly become non-producers, and they must be fed by the rest of us. The army is making great plans for camouflage to deceive the eyes of the enemy, but you cannot deceive a soldier's stomach. He must have real food.

I am told that the reserve stock of foodstuffs at each camp is worth $125,000, and there are 33 camps in the country today. This means that food valued at $4,125,000 is taken out of the regular channels of trade production and consumption. These figures give but a small idea of the need of food conservation on the part of the

individual at this time and the need will be greater next year. The National Emergency Food Garden Commission urges every soldier of the soil to at once promote himself to a Colonel of Conservation and to make plans for gardening and for conserving garden food in 1918 as never before.

The glass jar manufacturers of this country have delivered during the season of 1917 about 119,000,000 glass jars. A survey of the household supply of jars used for canning and preserving in some twenty typical towns throughout the country showed that the housewives of America in 1917 used but one new jar to over three and one-quarter old glass jars which were already on hand. Thus you see that in conservative terms the home women of our country put up nearly five hundred million quart jars of vegetables and fruits, certainly three times what had been accomplished in any season before. Next year, profiting by their experience of this year, they will can, I believe, millions more, and more will be needed.

The Commission is, of course, gratified at the success of its work in behalf of food thrift, and congratulates all who have had a part in this patriotic effort. Great credit is due to the newspapers of the country for their splendid and liberal co-operation in aiding to arouse popular interest in gardening, canning and drying, the interest which is so significant of the American determination to neglect no opportunity to strengthen the nation's war-time position.

Much has been learned this year by town and city people about the cultivation of the soil in the interest of thrift and health, and also about the conservation of its products, so that we may look with faith and courage to still greater results for 1918 when the need will be more urgent. I wish to emphasize the fact that there will be a greater demand for food for exportation next year than there has ever been before, and we must fill the demand.

The necessity for this is well expressed by Lord Rhondda, the British Food Administrator. He has said: "I hope the exportable surplus of American primary foodstuffs will be much larger than the present estimates, as the result of food economies by which the United States and Canadian homes are helping to win the war, just as surely as is the production of munitions. Every American woman is in a position to bring nearer the inevitable atonement for the brutal outrages in Belgium, Armenia and Serbia, the sinking of the Lusitania and other horrors, by her day-by-day economies. There need be no fear that the sacrifices will be wasted over here. Unless the Entente Allies are able to import the supplies necessary for the army and the population, victory may slip from our united grasp."

If 25 per cent of the new war gardeners failed, owing to inexperience, to get a good crop this year, not 10 per cent will fail next year. People who did not plant this year have been so enthused with this nation-wide success of the home gardening and home canning movement that they will not be doing their duty to themselves or to their country if they do not do their share in 1918. That they will do their duty I am altogether confident.

I want to praise the women of this country because it is the women who in a peculiar sense understand what the war means. It is my experience that the practical women of America have been practicing thrift for many years and that they know full well how to practice economy without parsimony, and that this year in addition they have added to their duties the patriotic work of extra food production and extra food conservation.

This war will be won in large part by fighting with food. We will do our duty in this hour of trial, and we have no greater duty than the production and conservation of food. This war is as much our war as it is the war of Europe, and unless we can keep the soldiers and the women and children of our Allies fed, the western line of defense may be thrown back toward the Atlantic seaboard, and it is well within possibility that in that case we would see the enemy's army on our shores.

To prevent this disaster calls for the best effort of every American household. You cannot starve Germany. Ambassador Gerard has told us so, and from the available evidence I believe he is right; but we will starve our Allies if we are so short-sighted, small and mean and unpatriotic as not to deserve the name of Americans. This must not be! It will not be.

You do not now have to be told again the need of food F. O. B. the kitchen door. This truth has made itself felt in millions of American homes this year. The town or city farmer who can raise even half of his winter supply of vegetables is able, as a result, to accomplish much as a constructive citizen. In other words, we must make a big drive to produce food in this country as near the point of consumption as possible, rout the middleman and the cold-storage man and help the railroads in the tremendous transportation problem that confronts them while the country is at war.

Glass jars and all other containers must be conserved this winter and the manufacturers must next year be prepared to meet the largest demand for them the country has ever seen. From every section of the United States and Canada come reports that the production of vegetables and fruits suitable for canning will next year far exceed the high water mark of this year.

The food problem is one of the vital issues of today. It is a problem from which none of us may escape. Each of us has his individual responsibilities in the situation. To win the final victory in the great war, America must feed not only herself and her fighting forces, but she must help to feed the people of England, France, Italy and Russia. To do this with the highest measure of efficiency is the real problem. There must be no lost motion. Every move must be made to count. Every act must be a blow for liberty in our work for Democracy to save and redeem civilization. It is not enough that we should all be alert to the food needs of America and her Allies: we must back that alertness with constructive skill and real industry.

Forestry for Boys and Girls

by Bristow Adams

"SHOES AND SHIPS AND SEALING WAX"

"I," SAYS Toto, "am going to be a averator."

"It ain't aver-ator," responds his older brother, "it's avee-a-tor."

"Well, anyhow, whatever it is, I'm going to be it."

"I'm not," returns Everett, "I'm going to be a soldier and shoot with a gun."

Toto maintains that he is going to fly and is going to shoot also, because, as he points out, the aviators that he knows are soldiers. He knows a good many, because there is an army aviation school near us, and ever since last June there had been class after class of young men, each group getting a start in the work, to finish in real flying at some other place in this country or abroad. Toto is a great favorite with all of them.

Soon Everett comes in and asks for ten cents to buy a wooden gun he has seen. I try to tell him that he can make a better one for himself, at which he turns the tables by saying "I can make one if you will let me use your saw."

He knows that the saw and plane and chisels and other tools, that father keeps locked-up, are not to be used by small, unskilled and careless hands; but he is sharp enough to see that I must yield the use of the saw to carry my point about his making the gun. So, on promise of care and quick, safe return of the saw to its right place he sets out to make the gun. He is good at this sort of task and does a neat job. The gun he makes is far bigger and better than the one he can buy.

Then Toto wants to make an airplane of some sticks I have been saving to use in holding up plants. He sees that I can not favor his brother and refuse him at the same time, so he gets the sticks, and both boys work together and make the toy plane.

WOOD furnishes them with the stuff they need. Small as they are, and as little used to workmanship, they can make wood serve their purpose. Was there ever such a useful stuff for making all sorts of things? Even the airplanes and the guns of the great war must depend on wood. Here is the whole range of uses, from serving child's play to man's fury. Of course, if the trees had anything to say about it they would be used only for building up, and not for tearing down, and would be man's play things rather than his destroyers. Yet ground wood, finer than sawdust, is a part of much of the gun powder.

Toto has, in common with other boys of today, a whole new field of make-believe. In my day we never took much stock in flying, except as we dreamed of it. Most boys and men, even old men who never had seen a man in the air, have had dreams of flying. It is common in children's sleep, I think, to dream of launching forth from a high place and floating in space, much as a bird sails, and without effort. Very few, I find, have not had this dream,—a dream that comes again and again, of being wafted through the air. And now Toto actually sees it, along with the rest of us, and when he is a grown man it will be common. War has made it come sooner than it would have come otherwise. One cannot help thinking what a boon flying will be in making forest

surveys. Already an airplane has been in use to search out forest fires.

PLAYING at war has been just as much a game for boys as dolls have been for girls. It was always a part of youth to fight battles of one sort or another, real and unreal. This year our boys have helped in real war by fighting weeds in home gardens. Maybe this thought has made weeding easier than I found it. Hoe in hand, to keep down the weed enemies, sounds very well these days. It was hard work as I look back on it, and I find that Everett and Toto will work till they are ready to drop, digging rows of trenches all over the place, but rows of onions to weed are not so good.

Boys are about the same, I guess, no matter what the time or place.

THERE was some fun, as I recall, in going miles over the fields after the mail, carrying a limber switch by way of a sword, and lopping off the heads of wild carrots and daisies that grew along the wayside, exclaiming, "Die, villain!" as the blossom heads dropped. The lumbering grasshoppers, flying up thick, were the bullets of the enemy; if one struck the hero's right arm he would have to transfer his sword to the left and keep up the fight; if he were struck in the leg he would have to hop along as best he could on one, trusting that it would heal before both pins were gone. If a grasshopper bullet struck him over the heart he just had to go to the hospital in a neighboring fence corner and find some slippery elm or blackberry medicine until he was cured of his wound. The folks at home used to have to wait a long time for the mail on these days of battle; and it must be owned that the hurts received when the hero returned home were more serious than the ones he got in combat. I suppose all this has been changed by the rural free delivery, and the small boys of the present day do not have the perfectly good excuse of going after the mail to get them out of the job of weeding the onions.

BUT that is not what I started to write in the beginning. It was rather to call attention to the great need of wood, and the greater need, while we still have the chance, to see that there shall always be plenty. The wooden sword and the wooden toy gun may go out of fashion. I hope they will, just as I hope this struggle will prove to be the War for Peace. But wood will never be less useful; and when I see it going into so many new things, such as airplanes, I know that man will need it and use it even more in the future than he has in the past.

When the Walrus and the Carpenter, on that well-known walk, spoke of many things, such as "shoes and ships and sealing wax," they did not get very far away from wood. Because shoes must be made on wooden lasts, and many are pegged with wood, the leather is tanned from an extract of tree bark; in Holland boys and girls wear whole wooden shoes. And as for ships, we know they are made from wood, and even the iron ones have wooden masts and spars. When it comes to sealing wax, the hardened gum of the pine tree, known as rosin, we are in the very heart of the use of wood. Let's keep it growing!

CHILDREN'S PLAYGROUNDS IN PARKS AND FORESTS

By SMITH RILEY, District Forester

"The paths, the woods, the heavens, the hills,
Are not a world today,
But just a place God made for us
In which to play."

WHO of us but does not love the mountains with their snow-capped peaks and forests and tumbling streams? More and more we are coming to realize that the National Parks and Forests of our country are nature's playground, set aside as vacation joylands for little folks and big. John Muir once said:

"The tendency now-a-days to wander in the wilderness is delightful to see. Thousands of tired, nerveshaken, overcivilized people are beginning to find out that going to the mountains is going home; that wilderness is a necessity; and that mountain parks and reservations are useful, not only as fountains of timber and irrigating rivers, but as fountains of life.

"So we wander in search of mountain wild flowers, following the trails that lead to the alpine meadows, listening to the bird songs as we pass, wrapped in the peace of the perfect hills, while all about us the infinite beauty of things created, the magic of the summer skies, the strength of the far-flung bastions, the purity of the eternal snows, and the glory of the flowers that bloom above the clouds, bid us remember that we are walking in the freedom of the garden wild with God of the open air." There are numberless men and women who see in the open only discomfort and apprehension. Such people are largely dependent upon the comforts of life, having received no opportunities in the active days of their youth to acquire a taste for the things of Nature and the great outdoors. Big places make big thoughts, and big thoughts make big men and women. Can we not then offer the use of our Parks and Forests as places of education for the citizens of this nation in which to teach their children the lessons of the wilderness? Mountain, prairie, and walking clubs are developing rapidly throughout the country. These offer outings to those grownups who have developed an appetite for outdoor life, but only occasionally is it possible for parents to have their children accompany them.

PLENTY OF WORK IN THE AIR IS GOOD FOR THEM
Here we catch a glimpse of the Boy Scouts, in camp on the Pike National Forest in Colorado, at their regular morning exercises, part of the routine of camp life.

A YOUNG EXPONENT OF LIFE IN THE OPEN
Rosy-cheeked and happy, he typifies the value of the opportunity offered by the recreational use of the National Forests.

There are two noted organizations, the Camp Fire Girls and the Boy Scouts, which take larger children into the out-of-doors. The children who join such clubs have, as a rule, a natural taste for country or mountain life, or have had opportunities to develop

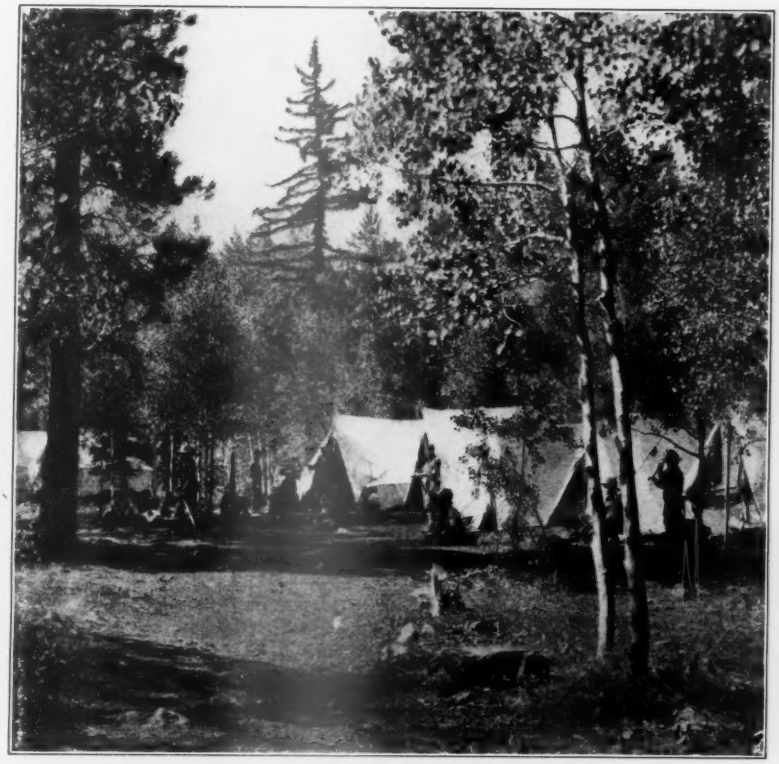
"JUST A PLACE GOD MADE FOR US IN WHICH TO PLAY"
A happy crowd thoroughly enjoying a picnic under the trees in the Pike National Forest in Colorado.

their "back to Nature" instincts. Is it not possible for us, however, to reach the hordes of younger children through these means, so they may learn the lessons of nature? Children receive vivid impressions from the ages of eight to fourteen. Why not, then, attempt to reach these younger children?

There is a present day tendency to develop and maintain camp grounds along through highways; to develop mountain foothill and waterside parks near cities. Throughout the West are many municipal parks and camp grounds where hundreds of people of all ages are given an outing each year. At none of these areas is there any form of development for the purpose of educating small children. Older children receive impressions from those things that influence adults, but the bulk of small children receive their keenest conceptions through play. Lessons that come in play are strongest and most lasting to a child.

Here is a big field for developing children's playgrounds in the open where they may teach the lessons which create a taste for nature. There is a tendency to make the playgrounds in the country very similar to those found on the school grounds or corner lots of a city. For example, the City of Denver has constructed a number of playgrounds throughout her mountain parks, amid the most beautiful natural settings imaginable. These are fitted with swings, teeter boards, merry-go-rounds, and turning bars; the same equipment that is placed upon city playgrounds. A child, unless he be exceptional, may go to such grounds and wear himself out at play, time after time, without receiving the least impression of the beautiful natural surroundings.

Can we not hit upon a plan of building up such playgrounds so that they will create a realization of outdoor life and the surroundings in the minds of children? Suppose in place of the swings, teeter-boards, etc., a miniature camp was constructed; a two-room log house with fire-place, furniture and an enclosure where the children could play at camping. To vary this, some playgrounds should be furnished with shelter cabins and a fire-place out in front, which would give a different phase of camp life. Playing housekeeping and giving parties is a child's favorite amusement. Why not make use of this to create a taste for outdoor life? Trees, shrubs and plants in the immediate vicinity of these camps should be marked with signs so the children might learn



BOY SCOUTS IN CAMP IN THE PIKE NATIONAL FOREST
A cheerful crowd, out for a good time. This camp indicates one of the many recreational uses to which the National Forests are put.

their name and appearance, and become familiar with the different kinds of forest growth, while cabins could contain pictures of the birds and animals common to that section. In addition to miniature camps, it has been suggested that where suitable areas, advantageously located, can be found, a miniature forest might be laid out with trails, fire lookout towers, fire boxes, etc. This would give the children a chance to play at forest protection and learn the lesson of preservation of all forest life. It is really surprising what a small per cent of both children and grownups who find keen enjoyment in outdoor life have any conception of the enormous damage to forest life wrought by carelessness. Thus, in making the National Forests and Parks attractive, let us think of the children of today as the men and women of tomorrow. Let us so construct playgrounds for them that through play they will receive a taste for nature and the lessons it teaches.

To be sure such playgrounds will cost something to construct and maintain, as will all camp grounds or pleasure areas prepared for the public. The children, too, will need instruction and direction at such playgrounds if they are to secure the greatest use and enjoyment out of them. It has been found that an officer must be stationed at camp grounds to guard against fire and assist the public, and to teach the children the use of these play camps. It is the child's nature to teach other children the play-games he has mastered, and thus will our little folks learn of outdoor joys and pleasures and return to their homes rosy-cheeked and happy—the better boys and girls.

A FAIR FIELD AND NO FAVORITES!
The always exciting "fat man's race" at one of the picnics enjoyed by hundreds of people each year in the National Forests.

LESSONS THAT COME IN PLAY MAKE DEEPEST IMPRESSIONS ON CHILDREN
This young American is Frank McConnell, son of Ranger McConnell of the Colorado National Forest, and he and his trusty friend are busily engaged carrying to the Ranger Station mail and supplies which have been left by stage three-quarters of a mile away.

UNIVERSITY EXHIBITS

The State College of Forestry at Syracuse University has had exhibits at eight fairs this fall. One feature of the exhibits showed an entire tree of Norway Spruce cut and sawed into various products, including two logs yielding eight foot boards, two fence posts, valuable if treated against decay, and one hop pole. The entire yield of the tree was fifty-nine board feet, and a chart which accompanied it gave cost and profit figures per acre per year, at the rate of growth which this particular specimen had made. Other features were specimens of paper made from bark which would otherwise have been absolute waste, and numerous other things manufactured from wood, but seldom credited to the forest, such as articles of clothing from fiber silk, and twine made from twisted Kraft paper fiber, rugs, phonograph records, wood flour, fiber shingles and transparent sheets of viscose, a wood product used as a substitute for celluloid. Another feature was a group of wartime products, showing food, medicine and explosives yielded by the forest.

HYBRID OAKS

BY GEORGE B. SUDWORTH

HYBRID oaks of this country are exceedingly interesting trees. They are the result of a natural crossing of two different species of oaks and, as a rule, they are strikingly distinct from other oaks in the peculiarly mingled characteristics of the parent species. Their distribution is very irregular, so that our knowledge of the ranges of the different forms is incomplete.

In all, there are approximately twenty different hybrid oaks now known. Nineteen of these inhabit Eastern United States, only one being known in the Pacific region, and none having been discovered in the Rocky Mountain Region* The fact that 60 per cent of the forty-eight native species of oaks grow in the East may partly account for the correspondingly greater number of hybrid oaks discovered in that part of the country, where necessarily there would be greater opportunity offered for crosses.

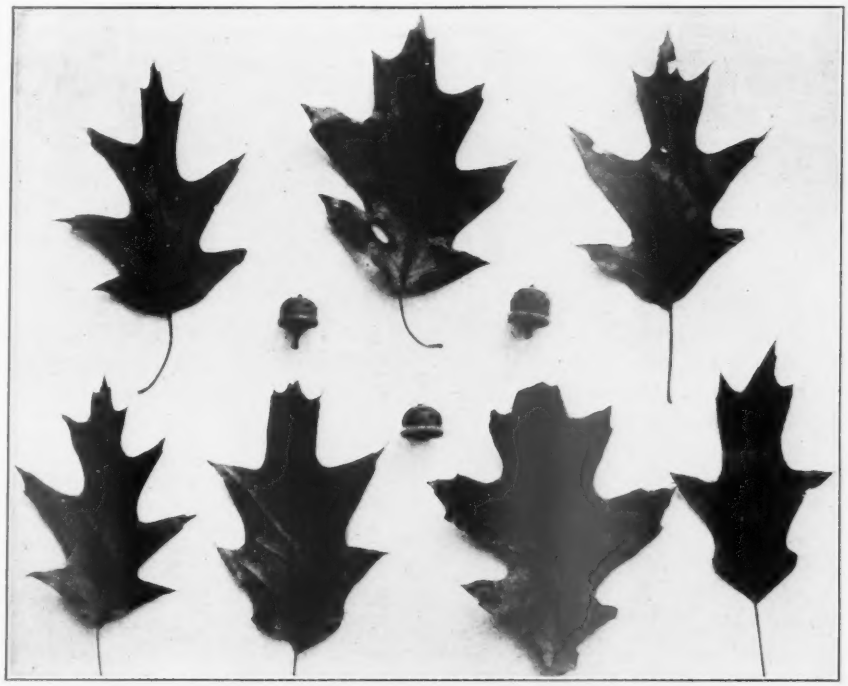


FIG. 1.—MATURE FOLIAGE AND ACORNS OF THE NEW HYBRID.

It will be seen that the shape and size of the leaves are very like those of the red oak, though many of them resemble the black oak more closely in shape, color and texture. The mature acorns are of the same general shape, though smaller, than those of the red oak.

There is no record of the crossing of white oaks and black oaks, all of the hybrid forms now known having been produced by crosses only between members of each of these two distinct tribes. Whether or not there is any inherent barrier to hybridization between white oaks and black oaks in the fact that the white oaks are annual fruiting trees and the black oaks are biennial fruiting species, is unknown.

A much larger number of black oak hybrids has been discovered than of white oak, there being sixteen black oak hybrids recorded and only four of white oak parentage. Whether or not the black oaks have a greater tendency to hybridize than do white oaks, is unknown. The relatively more frequent association of different black oaks than is the case with white oaks may also be a determining factor in the greater occurrence of black oak hybrids.

The determination of what parent species of oaks have produced the various hybrids now known is a matter entirely of recognizing the distinguishing characteristics of the parents as exhibited in the hybrid. No one is prepared to prove the supposed parentage of any of the hybrid oaks, and obviously because the crossing of the parent trees occurred without the aid of man. So far, no one appears to have tried artificially to reproduce any of these hybrid forms by cross-fertilization of their supposed parents. It is true, of course, that plant breeders in this country have had little or no incentive for crossing oak trees, because with the great variety of commercially useful species now available there would seem to be no pressing need of seeking new and better forms. Systematic botanists have contented themselves with naming and describing hybrid oaks just as they were found in nature, and have relied upon their judgment in determining the parentage. It is a noteworthy fact, however, that there is considerable difference of opinion among botanists as to the parentage of certain hybrid oaks. Thus, the parentage of one of the best known of our hybrid oaks, the Bartram Oak, first named Quercus heterophylla, has varied with the author from that of Quercus phellos x velutina and Q. phellos x

*Dr. William Trelease records (Proc. Am. Phil. Soc. LVI, 48, 1917), the existence of "Q. arizonica x grisea—Q organesis", which was doubtless found in the southern Rocky Mountain Region. His very excellent paper on "Naming Hybrid Oaks" also lists a number of apparently hitherto unpublished hybrids which were unknown to me when this article was prepared.

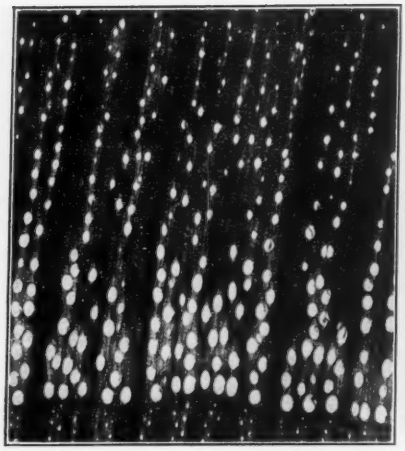


FIGURE 2.

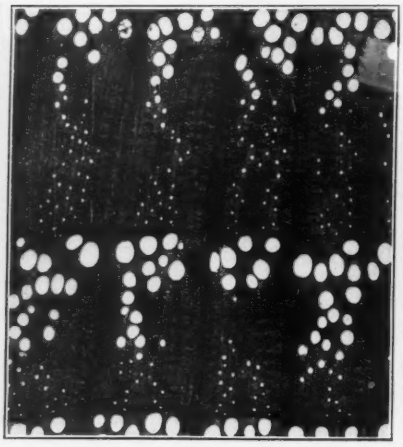


FIGURE 3.

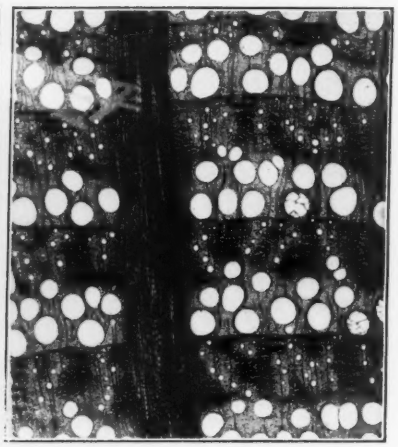


FIGURE 4.

PHOTOMICROGRAPHS WHICH MAKE POSSIBLE AN INTERESTING COMPARISON

A most superficial comparison of the cross-section of the wood of this new hybrid oak (Fig. 2) with that of Quercus borealis (Fig. 3) and Quercus velutina (Fig. 4) shows a unique distinction in the very large number of pores and in their gradual diminution in size in passing from the spring or early formed wood to the summer or late-formed wood of the annual ring. This would indicate that the new hybrid is more closely related to the red oak than to the black oak, in which there is a very abrupt change in size from the large pores of the spring-wood to the small pores of the summer-wood.

coccinea to Q. phellos x rubra (1).

Well Known Hybrid Oaks.

The following is a list of the native hybrid oaks discovered in the United States during the last hundred years Some of them have been found but once and in several instances the individuals discovered have since been destroyed. While a number of these trees are, undoubtedly, of hybrid origin, properly they must be designated as species, because they were first described under a binomial. Notable examples of such hybrids are Quercus morehus, Q. brittoni, Q. leana, Q. sinuata, and Q. heterophylla:

Quercus alba x stellata Engelm. (1877). Illinois.

Quercus alba x macrocarpa Engelm. (1877). Illinois and Vermont.

Quercus alba x prinus Engelm. (1877). District of Columbia and Vermont.

Quercus wislizeni x kelloggii Curran (1885);=Quercus wislizeni x Californica Sargent (1895);=Q. morehus Kellogg (1863). California.

Quercus coccinea x ilicifolia Gray (1867), near Whitinsville, Mass.

Quercus catesbaei x aquatica (2) Engelm. (1877);=Q. catesbaei x nigra Sarg. (1895);=Q. sinuata Walter (1788). Near Bluffton, S. C.

Quercus catesbaei x laurifolia Engelm. (1877). Near Bluffton, S. C.

Quercus catesbaei x Q. cinerea Small (1895). Florida.

Quercus cuneata x velutina (1917); = Q. digitata (3) x velutina Sudworth (1895). Tennessee.

Quercus georgiana x marilandica Sargent (1895);=Q. georgiana x nigra (4) Small (1895). Georgia.

Quercus marilandica x ilicifolia (1917);=Q. brittoni Davis (1892). The author of the latter name believed this tree to be a hybrid between the black jack and bear oak. Staten Island, N. Y.

Quercus marilandica x velutina Bush (1895). "Near Saputa, Indian Territory."

Quercus imbricaria x marilandica Sargent (1895);=Q. imbricaria x nigra (4) Engelm. (1877). Missouri.

Quercus imbricaria x velutina Sargent (1895);=Q. imbricaria x coccinea Engelm. (1877);=Q. leana Nutt. (1842). Central Eastern United States.

THE NEW HYBRID AND ITS DISCOVERER

This shows the new hybrid—the Hawkins Oak, growing in a wooded section of the Hawkins estate in western Tennessee. It is some 85 feet high and 35 inches in diameter. Certain peculiarities about the tree attracted the attention of Mrs Eugene Hawkins, prompting closer examination and the consequent discovery of the hybrid. Mrs. Hawkins is seen standing by the tree.

FIGURE 5.

(1) Now properly known as Quercus borealis Michx., Q. rubra L., long supposed to have been applied by Linnaeus to our red oak, was in reality given to our Spanish oak, which most of the mountain people in Virginia, North Carolina and Tennessee call "red oak."

(2) Now known as Quercus nigra, the black jack, to which this name was so long applied, now being designated as Q. marilandica.

(3) Now known as Quercus rubra.

(4) Now known as Quercus marilandica.

Quercus imbricaria x palustris Engelm. (1877). Missouri.

Quercus phellos x velutina;=Q. heterophylla Michx. f. (1812). Pennsylvania, New Jersey, Delaware, Staten Island, N. Y.; District of Columbia, Virginia, North Carolina, Alabama, Texas.

Quercus phellos x marilandica Sargent (1895);=Q. rudkini Britt. (1882). Staten Island, N. Y.

Quercus phellos x rubra (1917);=Q. phellos x Q. digitata (3) Small (1895). North Carolina.

Quercus phellos x ilicifolia Peters (1893). New Jersey.

Quercus michauxii x macrocarpa Sudworth (1897). Southwestern Tennessee.

The Hawkins Oak, A New Hybrid.

Through the courtesy of Mr. Joseph Meehan my attention was called to a hybrid oak which Mrs. Eugene Hawkins discovered in Carroll county, West Tennessee, in October, 1912. An excellent photograph (Fig. 5) taken by Mr. W. R. Mattoon shows it to be some 85 feet high and 35 inches in diameter. The straight, slightly tapering trunk is free from branches for 40 feet. An interesting fact about this tree is that it is growing in a wooded section of the Hawkins estate which is itself a part of the original 25,000-acre grant made in 1791 to Mr. Hawkins' great-grandfather, Isaac Roberts, by the State of North Carolina, then included in a part of the latter state known as the Western District, but now a part of West Tennessee.

Being familiar with the forest trees in that section of Tennessee, Mrs. Hawkins noted with surprise that the flesh of mature acorns from this tree, at first taken to be a red oak (Quercus borealis), was a deep yellow, those of the true red oak having a whitish flesh. A further careful examination of the tree showed that the trunk bark (Fig. 5) resembles in its marking that of the black oak (Quercus velutina), while the shape and size of some of the leaves (Fig. 1) are very like those of the red oak. Many of the leaves, however, resemble in shape those of the black oak, to which they are all similar in color and texture. The mature acorns (Fig. 1) are of the same general shape as those of the red oak, but of smaller size, ranging in length from five-eighths to three-fourths of an inch and in diameter from five-eighths to eleven-sixteenths of an inch. Many of the acorns show more or less distinct vertical stripes. The twigs and winter buds of this hybrid are so like those of the red oak as not to be distinguished.

A superficial comparison of a cross-section of the wood of this hybrid oak (Fig. 2) with that of Quercus borealis (Fig. 3) and of Q. velutina (Fig. 4) shows a unique distinction in the very large number of pores and in their gradual diminution in size in passing from the spring or early-formed wood to the summer or late-formed wood of the annual ring.* The gradual diminution in size of the pores in the wood of the hybrid would seem to indicate a closer relationship to the red oak than to the black oak, in which there is a very abrupt change in size from the large pores of the spring-wood to the small pores of the summer-wood.

It is proposed to designate this hybrid oak as X Quercus hawkinsi, in honor of its discoverer, Mrs. Eugene Hawkins, the writer's belief being that it originated from the crossing of Quercus borealis and Quercus velutina, both of which are growing in the vicinity of the hybrid tree. Quercus palustris also occurs in this locality and may possibly be one of the parents. The fact that the striped acorns of Quercus palustris have yellow flesh, and are similar in shape to those of the red oak supports this suspicion. On the other hand, however, the acorns of the black oak are striped and have a yellow flesh. Moreover, the similarly large size of the leaves of this hybrid oak with the color and texture of the black oak, and the close resemblance of the trunk bark to the black oak would seem to point more strongly to this species as one of the parents than to the pin oak.

So far as tested the acorns of Quercus hawkinsi appear to be only moderately fertile. Acorns planted by Mr. Joseph Meehan have produced one seedling, which is now about three years old, and a small quantity of acorns planted by the writer at the Letchworth Park Forest and Arboretum at Portage, N. Y., have yielded but one seedling. Some of the leaves of these young plants are identical in shape with those red oak seedlings of comparable age; while occasional leaves strongly resemble those of young black oak. It will be interesting later to note the types of adult leaves produced by these plants.

*The author's cordial thanks are extended to the Forest Products Laboratory at Madison, Wisconsin, for preparing these illustrations.

THE NATIONAL ASSOCIATION of Box Manufacturers, through an agreement with the United States Food Administration, is working out details of standardized wooden boxes for condensed milk, canned fruit and vegetables for export. The specifications cover the width, length and thicknesses of the sides, ends, tops and bottoms of the various types of boxes, the number and position of the nails to be used, the cleats and iron straps required, and the matching and glueing up of the pieces. A standard scale of prices for the different types of boxes delivered at any point east of the Missouri River has been agreed upon. The wooden box industry, through its association, will undertake to see that the Government's requirements for boxes are taken care of promptly.

THE RECEIPTS from the sale of timber on the National Forests in California amounted to $154,271.98 for the fiscal year 1917. This is an increase of 50 per cent. over the receipts for the fiscal year 1916 and 100 per cent. over the receipts for 1915. Twenty-five per cent. of this money goes to the state for the school and road funds of the counties in which the National Forests are contained.

DR. HUGH P. BAKER, dean of the New York State College of Forestry, is at the Second Reserve Officers' Training Camp at Fort Sheridan, Illinois. There are many prominent lumbermen in training at this camp and their practical experience is proving useful.

A TREE THAT PRODUCES SOAP

AS a relatively new member of the American tree family the Soap-nut, *Sapindus utilis*, is entitled to friendly consideration. Originally the tree came to this country from China. The first importation was made into Florida by Rev. Benjamin Helm, who brought some of the seeds from the Orient more than 30 years ago. From these seeds only one fully developed tree is in existence and for many years the owner of this one had no thought that his tree produced anything of value.

It was in 1905 that American attention was first attracted to the soap-nut tree as a tree of importance in the matter of nut bearing. At that time there was published a report on the economic value of the tree prepared by United States Consul Kedder at Algiers. This report made possible the real development of soap-nut cultivation in America. Its publication was followed by generous importation of the seeds from Algiers, arranged by E. Moulie, who now lives in San Diego, Cal., and who had been instrumental in instigating Consul Kedder to make an investigation and report. The seeds imported by Mr. Moulie were distributed free of charge to people who showed such interest as to indicate that the planting and cultivation would be done with care. In addition to making the importation of seeds Mr. Moulie has made it a practice to buy every year practically the entire crop of seeds from the original American tree, and these have been distributed broadcast. He estimates that as a result of these gifts there are now 500,000 soap-nut trees growing in Florida alone, and large numbers in other Southern States and in 19 foreign countries to which he sent seeds.

THE FRUIT OF THE SOAP-NUT TREE.
From the hull of the nut is procured raw material for the manufacture of soap. The material may be used without compounding, as it makes a perfect lather. It is also useful for making beverages which require foam.

The planting and cultivation of these trees attracted widespread attention and the Department of Agriculture made some importations from China, materially increasing the number of trees planted in the United States.

Several important uses are attributed to the product of the soap-nut tree. The hull of the nut supplies raw material for the manufacture of soap and other articles which require an ingredient with saponaceous properties. This material may even be used as soap without compounding. By shredding the hull and using it with water as if it were soap, a perfect lather is readily obtained and some authorities state that the cleansing qualities are superior to manufactured soaps. The extract's efficiency as a foam producer makes it useful as an ingredient in carbonated beverages. The kernel yields a fixed oil, which some say for culinary purposes is equal to olive oil. Some therapeutic value is also attributed to the nuts.

The wood of the tree is close grained, takes a good polish, and is said to be well adapted for furniture making. The tree grows to a height of 50 feet. It is not expected that it will be used for its timber, however, as the yield of nuts is said to be from $10 to $20 a year for each tree. The tree begins bearing at six years of age.

THE tremendous demand for forest products of all kinds which the war has created will by no means terminate with the cessation of hostilities. The reconstruction of Belgium and northern France will draw heavily upon the forests of the United States. The action of the Federal Government and the large lumber producers in the United States in sending Federal Trade Commissioners abroad for the purpose of studying export markets makes the future in the lumber business appear extremely bright. Authorities are predicting an increased demand for trained foresters during the next decade inasmuch as many phases of forest utilization are now demanding expert training which the trade did not require in the past.

THAT there is enough fuel wood in Indiana forests going to waste to run every heating and cooking stove in the state for a year is declared by the Indiana State Board of Forestry. The board argues that the fuel value of a cord of good beech, sugar or hickory wood equals that of a ton of soft coal, that the average price of wood is about half that of coal and that people pay double price for the luxury of burning coal. Owners of woodlots are advised that to remove the dead, dying and weed-trees will not only furnish a vast supply of fuel but will be of distinct advantage to the remaining trees. Municipal woodpiles are being advocated, to be supplied with fuel which could be obtained from woodlot owners for the cutting.

EDIBLE FRUITS OF FOREST TREES

IT is said that Daniel Boone and some of our other early pioneers could go into the wilderness with only a rifle and a sack of salt and live in comfort on the game and other wild food which the woods afforded While few people want to try that sort of thing nowadays, persons who know the food value of the fruits of our native trees and shrubs are, according to foresters, able to use them to good advantage in supplementing other foods.

Aside from the numerous edible mushrooms, roots, fruits of shrubs and smaller plants, the trees of our forests afford a large variety of edibles which are highly prized by woods connoisseurs. First in importance, of course, are our native nuts—beech nuts, butternuts, walnuts, chestnuts and chinquapins, hazel nuts, and several kinds of hickory nuts, including pecans. The kernels of all of these are not only toothsome but highly nutritious, and are used by vegetarians to replace meat. The oil of the beech nut is said to be little inferior to olive oil, while that of butternuts and walnuts was used by some of the Indians for various purposes. The Indians, it is said, also formerly mixed chestnuts with cornmeal and made a bread which was baked in corn husks, like tomales. In parts of Europe bread is made from chestnuts alone. The chestnut crop in this country is being reduced each year by the chestnut blight disease, which in some sections is gradually killing out the tree.

Acorns are commonly thought to be fit only for feeding hogs, but many kinds of them can be made edible and nourishing for people as well. The Indian custom was to pound or grind the acorns up and leach out the tannin, which makes most of them unfit for eating when raw, by treating the pulp with hot water. The resulting flour, which contained considerable starch, was made either into a porridge or baked in small cakes of bread. As a rule, the acorns of the various white oaks having less tannin, are the ones best suited for food, but Indians also used those of the black oaks, even though they contain much tannin. The acorns of the basket or cow oak, the chinquapin oak, shin or Rocky Mountain oak, live oak, and of several other species, are sweet enough to be eaten raw.

Another nut which is not suited for eating raw, but from which a palatable food is said to have been prepared by the Indians, is the buckeye. The kernels of these nuts were dried, powdered, and freed of the poison which they contain when raw, by filtration. The resulting paste was either eaten cold or baked.

Several western pines have seeds which play an important part in the diet of the local Indians. Perhaps the best known of these is the fruit of the nut pine or pinon which forms the basis for a local industry of some size Not only is it extensively eaten by local settlers and Indians, but large quantities are shipped to the cities where the seed is roasted and sold on the street. The similar seed of the Parry pine and the large Digger pine seeds are eagerly sought by the Indians. The latter tree is said to have gained its name from its use as a food by the Digger Indians. The seeds of the longleaf pine are edible and are improved by roasting. Indeed, it may be said that most nuts are more digestible when roasted than if eaten raw.

One of the best-known fruits, the foresters say, is the persimmon, which is edible only after it is thoroughly ripe. As this is usually not until late in the fall, it is commonly thought that the fruit must be frostbitten. If the persimmon is eaten before it is well ripened, the tannic acid which the fruit contains has a strongly astringent effect, which justifies the story of the soldier in the Civil War who said he had eaten green persimmons so as to shrink his stomach up to fit his rations. The pawpaw, or custard apple, is also best when thoroughly ripe. The fruit of some species of haws is eaten or preserved in different parts of the country, while those of several different kinds of wild cherries have a food value and are used for various purposes. Wild plums are abundant in certain sections and occur in particularly plentiful quantities along the streams in the Eastern and Middle Western States.

Several varieties of wild crab apples make delicious jellies. Some of the largest, which attain the size of small apples, are more or less abundant throughout eastern North Carolina. Elderberries are frequently used for pies and for sauce. Those found in the West are sweeter and have a better flavor than the eastern varieties.

The berries of the hackberry, or sugar berry, as it is called in the South, are dry, but have an agreeable taste. Those of the mulberry are sweet and juicy when ripe. The mulberry is valued in some sections for feeding hogs and poultry and some species are occasionally cultivated.

Many people like the fruit of the shad bush, "sarvice" berry, or June berry, as it is variously called. In parts of the country this fruit is used to make jelly.

The French Canadians are said to use the acid flowers of the redbud, or Judas tree, in salads, while the buds and tender pods are pickled in vinegar. Honey locust pods, often locally called "honey-shucks," contain a sweetish, thick, cheeselike pulp, which is often eaten. Those of the mesquite furnish the Mexicans and Indians with a nutritious food. The Creoles of Louisiana, famous for their cookery, are reported to use the young buds of the sassafras as a substitute for okra in thickening soups.

WOODLOT owners will be interested to know that birch, cherry, walnut, oak and mahogany have been approved for airplane propeller stock by the United States Government. Spruce is the principal wood used for the frames.

IT has recently been discovered that gum lumber immersed in pure gummed spirits of turpentine lasts many years longer when exposed to open air. The usual method of treating the lumber is to give it three coatings and allow it to thoroughly dry after each one.

FIGHTING THE PINE BLISTER DISEASE

MANY inquiries come to AMERICAN FORESTRY asking if it is possible to eradicate the pine blister disease or prevent it spreading by spraying. No spray has been found which can be used effectively against the blister rust either on pines, currant or gooseberry bushes. Spraying is not recommended, because the disease spreads very rapidly on currants and to considerable distances. A number of tests have been made by men who realize the necessity for careful work and who presumably did the most thorough work possible under the circumstances. In Europe, Ewert attempted to spray black currant bushes thoroughly enough to keep the disease off them. He concluded that it was impossible to do it. A similar attempt was made by McCubbin in Ontario two years ago. He sprayed every two weeks and also concluded that it was an impossibility to keep the disease entirely off the sprayed bushes. Other attempts have been made in different localities with the same results. Unless absolute freedom can be secured from this disease, spraying is inefficient, since a single rust pustule is sufficient to start the disease upon neighboring currants. The disease is known to jump from currant to currant at least one-half mile, and under favorable conditions it jumps several miles.

The question of securing a resistant variety of currant or gooseberry is still in need of further investigation. It is desired that scouts send in to Dr. Perley Spaulding, United States Department of Agriculture, at Washington, cuttings of currants and gooseberries which show marked resistance to the disease. Only cuttings of apparently resistant uninfected plants which are under very severe test conditions, that is, with heavily infected bushes within a few feet, need be sent in. Wrap specimens in damp (not wet) moss or dead leaves and label with your own name, place where collected and date. State briefly why the specimen is thought to be resistant.

Experiments are being carried on to obtain if possible some cheap chemical which will kill wild currant and gooseberry bushes. Over 500 experiments are in progress, using different chemicals and methods. Various derivatives of arsenic, sulphur and ammonia are being used as a spray to kill the foliage. Fuel oil is also being tried. Plots were sprayed with fuel oil and two days later burned over without good results. The soil about the plants in one series of experimental plots is being treated with dry chemicals such as salt, calcium chloride and sodium carbonate. Sodium arsenite, sodium cyanide and fuel oil are injected into the soil near the roots of bushes in liquid form. Some of the gaseous chemicals employed are sodium sulphid, sodium bisulphid, chloride of lime, calcium carbide, carbon bisulphid, formalin, chlorine water, hydrogen sulphid water, turpentine, nitro-benzine derivatives, crude carbolic acid, etc. These substances are placed in the soil around the roots of wild currant and gooseberry bushes in various quantities.

Thus far the use of chemicals as outlined above has met with very little success. In addition, mechanical methods of removal are being tested to determine comparative costs and efficiency in preventing sprouting from the roots.

Where men are otherwise liable to the draft, no exemptions, either permanent or temporary, have been granted to Government blister rust workers. However, it is possible that temporary delay in reporting for duty until after the close of the present season's work may be secured for men whose services are highly necessary for the conduct of the work. No request for delay in draft can be made until the men are notified to report for duty at the army camps. It was announced that 30 per cent of the quota of each district would be called on September 5, the next 30 per cent September 15 and another 30 per cent on September 30. The remaining 10 per cent was to be mobilized as soon after that date as possible.

The following are the conclusions reached by experts who have made a study of the pine blister disease:

The essential thing in controlling the blister rust is to get out all currant and gooseberry bushes. The most effective time for doing this is in the early spring, and this part of the season should be used for rescouting control areas.

It is not feasible to spend time and money in scouting and eradicating diseased pine in New England, except where there may be outbreaks of the disease in new territory.

The establishment of control areas, in which all currant and gooseberry bushes, both wild and cultivated, shall be eradicated as far as possible, is regarded as the most practicable means of limiting the ravages of white pine blister rust; and owners of pine woods are urged to co-operate with state authorities to control the disease in their several localities.

In the expenditure of funds appropriated for blister rust work, the following plans are generally approved: 1. The method of direct state experimental areas to determine the cost of control by means of the eradication of wild and domestic bushes under various conditions; and, 2, such co-operation with private owners as will give expert direction or supervision to their work.

Localities established as control areas should be scouted at least four successive years for currants and gooseberry bushes.

Men inspecting should be required to carry whisk brooms and to brush their entire clothing with these after dipping them into disinfectant when circumstances require, also thoroughly to wash their hands and arms.

OUR FOREST RESOURCES AND THE WAR

BY E. A. STERLING

IF our newspapers some morning should proclaim in a double-ribbon head that "Lumber Wins the War," it would but little over-emphasize the indispensable part our forest resources are playing in achieving ultimate victory. Such a headline will not be seen, but the papers can safely say any day or every day that the war cannot be won without lumber.

It is all so big that more than a meager comprehension of what is going on along any line is impossible now. The wonderful accomplishments come from a co-ordination of effort, requiring the combined use of many materials. What is big today may be small tomorrow while headline news developed at one point might lose significance if it was known what was really going on somewhere else. The perspective will have to come later. From the isolated facts now known comes the realization that of all of our wonderful natural resources, industries and facilities of every kind, which are being drawn on to the utmost, forests and their products are in the front rank.

Our use of materials, enormous as it was in normal times, has been increased beyond precedent to fill military requirements. It is one of the saving factors for America and the whole Allied cause, that this nation was so blessed with its resources of iron, coal, lumber and foodstuffs. It is as true now as when Adams Smith first wrote the obvious fact, that the source of practically all income and materials, is the soil. Today the earth produces the ore for the steel; the coal for the fuel; the forests for the lumber and the grain for the food, which give America and her Allies the supremacy that will win the war. We all know these things without many fully realizing their significance. It is only when some essential is no longer available that its indispensable character is revealed. We take it for granted that coal and iron will be mined, and steel made for the guns, and myriad other military appliances. We need wood for shelter, ships, and many other construction purposes, and simply go and cut it from the forests. The steps in the production, transportation and fabrication of these materials are lost sight of, as is also the fact that they are basic natural resources without which no country can prosper, much less win a war.

Our forest resources are producing material as indispensable as steel. Wood is demanded for war purposes because of the well known but rarely thought of characteristics which make it the most widely used building material. It is indispensable both in war and peace because it is available everywhere; can be readily cut and shaped in any size or form; because it combines great strength with lightness; is easily worked and adaptable; is obtainable in kinds and grades for all purposes, and is a non-conductor of heat. It is natural, therefore, that it should be one of the materials in greatest demand for war purposes.

To say that two or three billion board feet of lumber are being produced in the shortest possible time to meet the most urgent war needs the country has ever known, conveys very little. Even to say that a single billion feet would make a boardwalk ten feet wide from New York to Petrograd, via Vladivostok, really does not convey the full impression. As a matter of fact, no one really knows just how much wood is being used in our war preparations, nor does the number of feet especially matter. It is extremely important, however, to know that our forest resources are fully able to meet the unprecedented demands upon them, and to do it without materially reducing our reserve timber supply. It is equally important that the producing facilities of the lumber industry are able to shift from normal routine and produce sizes, kinds and quantities of timber as needed by the military authorities.

In the war news for many months have been frequent references to wooden ships, the army cantonments, and the new airplane fleet. These are among the large items in which wood is almost the exclusive construction material. In addition, however, are the docks and wharves, both here and in France, the warehouses, boxing and crating lumber, hangars and hundreds of smaller uses. The necessary kinds of wood required for all of these things, the unusual specifications and sizes, the large orders for wooden items which usually are produced only in small quantities, and the necessity for haste in production, indicate the diversity of demands which the forests must meet.

A Washington dispatch in late October reported over 45,000 cars of lumber shipped for government war purposes or orders distributed alone by the Committee on Lumber of the Council of National Defense. This gives a clew as to the magnitude of the war lumber output, yet is only a beginning. Nor do these 45,000 carloads, which would make a train 500 miles long, represent the total consumption, many orders being placed through sources other than the Lumber Committee.

The indispensable character of the lumber required is shown by the many purposes for which it is used. The National Guard camps and National Army cantonments comprise hundreds, if not thousands, of acres of wooden buildings. At one camp 50 carloads of materials were unloaded a day for the construction of 746 buildings, in which over 30,000,000 feet of lumber was used. Warehouses and cold-storage plants require millions of feet. About 900 carloads of dock and bridge timbers and other construction materials have been cut for export for American army purposes in France. Nearly 4,000 carloads of yellow pine alone have been shipped for wooden

ship construction, besides nearly as much fir and hardwood. Each wooden ship requires about a million and a half board feet, in addition to that used for the ways and scaffolds. Aviation schools and camps, army trucks and boxes, take millions of feet more.

Just as items: One hundred and thirty thousand pieces of piling for docks were in one order, while another government requisition called for 20,000,000 ammunition boxes, all to be made of wood. If these piles averaged 30 feet long, they would extend 800 miles, or nearly from New York to Chicago, if placed end to end. At Washington 10,000,000 feet of lumber has been ordered for new frame structures to accommodate army bureaus. At one government shipyard, somewhere on the Atlantic Coast, 50,000,000 feet of heavy lumber and timber is needed for ways and general purposes. One Pacific Coast emergency lumber bureau has received orders for nearly half a billion feet of one kind of wood; while for air-craft stock well over 100,000,000 feet of spruce alone will be required. In September contracts were awarded by France for 24,000,000 feet of spruce; Italy, 9,000,000 feet, and England 36,000,000 feet. Lumber for portable or collapsible military buildings of various kinds, for the use of the American Army in France, has just been requested. The first order is for about 15,000,000 feet, with ultimate needs aggregating several hundred million feet. Creosoted wood block flooring is to be used in government munition plants. An order for 38,000 yards, equivalent to two miles of street paving, is soon to be placed. These are but examples of the demands which our forests are meeting.

A hundred years ago, before the days of steel ships, treenails were a well-known product of the forest, but with the decline of wooden ship building, their production practically ceased. With the inauguration of the present shipbuilding program, treenails were suddenly in demand in greater quantities than ever before, with the result that emergency measures had to be taken to insure a supply. Locust is preferred to all other woods for this purpose, but since the supply is not sufficient, several other woods are now used in their manufacture. It perhaps should be explained that these treenails are long wooden pins, cut 20 to 26 inches long and 1¼ inches in diameter. This is one example of the new demands which have been faced and met in supplying wooden products for war purposes.

We have accepted our forest resources as a matter of course, using them in many cases none too wisely. With a standing timber supply which is still sufficient to take care of all requirements for many years to come, lumber has simply been cut where most available and as needed. The lumber industry has strong resources, and is directed by men able to meet any emergency such as at present exists.

Every conceivable war requirement for wood can be met, although, of course, in some cases not as promptly as might be desired. In the western forests alone there are almost 4,000 miles of logging railroad, 870 logging locomotives, 13,000 cars and other necessary equipment. With a normal annual lumber output valued at over half a billion dollars, mill and logging facilities were fortunately available for the production of diversified forest products for war purposes, which have a value beyond any dollars and cents figures because indispensable in the preparations for victory.

It should be remembered, too, that while the military needs are being taken care of, lumber for the every-day needs of the country is being produced as well. This alone, even with the decrease in building operations, will not fall far below 40,000,000,000 feet per year. Although their importance transcends all else, the war requirements are a comparatively small percentage of the total output. The emergency which the lumber industry has met has not been in the volume of the wood required, but rather in the urgency and special requirements.

When peace is attained—with victory—and the mills cut only for the normal requirements of peace and for reconstruction in Europe, it will be found that our forests have fully met the unusual demands upon them, and remain one of our greatest natural resources. It would be most gratifying if out of this crisis should grow a better public realization of the part the forests play in the economic stability of the nation. We shall always need wood for construction, fuel and the arts of civilization; the forests alone can supply it.

THE New York State College of Forestry at Syracuse has recently sent out a circular letter to Chambers of Commerce throughout the state warning against the ravages of the tussock moth, which bid fair to be severe on shade trees during the next growing season. The egg masses, which are white and conspicuous, may be seen readily at the present time on the bark of elms particularly, and these may be collected and destroyed or daubed with creosote so that they will not hatch. The college, in its letter, has suggested that local shade tree or park commissions take the matter of destroying the egg masses in hand at once and push it vigorously.

THE College of Agriculture, Cornell University, offers three courses in vegetable gardening during the short-course term which extends through a period of 12 weeks from November 7 to February 15. Two of these courses, one in commercial vegetable gardening, and the other in vegetable forcing or greenhouse vegetable culture, are planned to be of special value to those who contemplate vegetable gardening as a life work. The course in home vegetable gardening is designed to meet the requirements of those desiring to secure a general knowledge of the principles of vegetable production for home use.

PLANS for a model after-the-war camp at Mount Gretna for Pennsylvania's National Guard have been discussed lately between officials of the Adjutant-General's Office and the Department of Forestry. These plans take into account the increased productivity, capacity and general beautification of the fifteen hundred acres of timberland included in the State's two-thousand acre military reservation.

EDITORIAL

FORESTRY AS A PROFESSION FOR YOUNG MEN IN THE UNITED STATES

THE great war has brought home to our people a number of very interesting facts regarding the necessity for and the extensive use of wood, and with this, the importance of the forest and its proper care. Suddenly we learn that wood is not merely useful as lumber, fuel, telegraph poles and pulp wood for newspapers, but that even in this age of steel and cement we want enormous quantities of wood for ships and camps, for railways and corduroy at the front, a hundred million feet or more of high-grade spruce for airplanes.

Beyond this, we find that wood is made into clothing, bedding, fiber for fiber cases and shoe soles, in short, that it may be converted into anything from paper collars to carwheels.

Even this does not exhaust the list, for the laboratory now tells us that sugar, and drinkable alcohol, as well as the old products of wood alcohol, wood vinegar, etc., can be and are made and used in enormous quantities.

War has taught us also the simple fact, well known to foresters but apparently unknown to our statesmen, that a country with its forestry work properly organized and supported has 20 years' supply of timber constantly stored up and ready for use. Forestry has saved Germany in this period of need.

The sudden war demands have called attention to the fact that while mere brush and uncared for woods, such as are now a great part of our eastern woodlands, may help the landscape in looks, and may be good hunting ground, they are not forest, and are of little use now when the United States needs one hundred and fifty million feet of select spruce for flying machines.

The nation has been stirred up in the last six months regarding the importance of using our soil to its full capacity, and we are discovering that the choice of the right crop is foremost in this work, and also that on hundreds of millions of acres the right and only crop is the forest crop.

Our people realize now as never before that the food, clothing and housing materials are products of the soil, that they need land, labor and time for their production, and especially that the forest crop needs a long time—that the spruce planted today requires a century and more to make fit stock for airplanes.

It is beginning to dawn on some of the people in power that this care of one of the great crops of the world, the care and planning for properties for a century hence, requires a little more than a mere wood chopper, and that certainly it requires policies which have some show of continuance.

What great field this offers for the young men choosing a profession. Today we have a consumption, in peace times, of over forty billion feet of lumber alone; a forest area of about five hundred million acres, or more than 16 times the State of New York, and a population over one hundred million, and rapidly growing in numbers and in wealth and in its demands on the forest. And the care of this empire, the production of this yearly timber crop for the greatest people of the earth speaking one language, this great task is the work of the American forester.

A fine beginning has been made. Thirty years ago forestry was not yet in our dictionary; there was not a forester in the land with an acre of woods or a log of timber to sell. Today the Forester of the United States cares for over one hundred and forty million acres, an area larger than the combined area of all the forests of the German Empire; and today the Forester offers timber for sale in quantities of over five hundred million feet, and is in position to offer more than any other person in the world.

A number of schools have begun to prepare men for this work, but so far the supply of real foresters is in no proportion to the task before the profession.

In Germany a forester cares for about 10,000 acres of forest and usually has two to four assistants. On this scale we would need a body of 50,000 foresters and about 200,000 assistants, besides a large body of specially trained labor, to care for our woods as they should be cared for. Today not the hundredth part of this number of available men exists in our country.

The American way is not to run after the salesman—the man who has his labor or his goods to offer must hustle and prove his worth.

It is a safe estimate that 10,000 good, capable, honest and industrious men can find employment in the forest work just as fast as they really hustle and prove that they are worth having. And 5,000 more of stronger men can force their way into the forest business and acquire forest property and be their own foresters.

In Central Europe the forester is an educated, respectable and respected man, a power in his community, useful in times of peace and exceptionally useful and efficient in time of war.

In the United States the young forester (for so far there are practically no others) has already made a fine reputation for himself. He has established a real administration over millions of acres of forest, over billions of dollars worth of property; he has surveyed millions of acres, built hundreds of miles of roads, trails and telephone lines. He has not only organized a fine protection for public forests, but has done this also for private

organizations, which in the past failed entirely in this effort.

The forester in the United States has proven himself a public servant of the highest order and value.

A forester's life is one of the finest that any enterprising, hardy man can desire; work and hardships mingle with leisure and freedom, and to this is added variety in work and variety in place, the out-of-doors and a clean and beautiful environment. His work is not of the petty three-cent clerk character; he deals with large things, thousands of acres, millions of timber. The salary of the forester is good in the Old World and is good here. In the United States service it has been rather low, considering the high cost of living and special expenses, and it is to be hoped that Congress will see the necessity of substantial advances. But even here the forester has fared just as well and even better than the teacher, the doctor, lawyer, etc. Considering the length of time, the lack of experience, etc., the forester in the United States has fared well. When young men of just fair capacity and only four to eight years' experience draw $2,000 and as high as $4,000 per year, while good teachers of 20 years' experience work for $2,000, there should be little complaint.

This statement would be incomplete without a word on the course of study which the forester pursues at school. The course in forestry normally takes up—in sciences—mathematics, physics, chemistry, geology and mineralogy, botany and zoology; then also surveying, including map making, besides the usual courses in forestry proper which take up about 40 per cent of the time. This program is so well planned, has been fully tried for years, has proven useful in so many cases for work in other lines besides forestry, that it is not at all boastful to say that a student who takes a forestry course is far more certain of a useful, well-balanced science course than is the student who trusts his own immature judgment and the enthusiastic pleadings of the various specialist teachers.

To sum up: The field is immense in its extent, interesting and enjoyable in character and appreciative in its pay. The United States has the forests and lands—the people, the industries. We need the foresters and we shall have the foresters. The forester even now is making himself felt the length and breadth of the land, and in this hour of war he is proving a fit rival of his colleagues abroad.

BAD FOREST FIRE SEASON

THE total number of fires extinguished by private, state and Forest Service employes during the past season in the Pacific Northwest was 7,688, of which 938 were classed as bad fires. All interests for forest protection combined employed 2,579 regular patrolmen outside of about 12,000 extra fire fighters, the total expenditure for fire protection by all concerned being $1,825,000 Since the extremely disastrous fires of 1910 aroused public sentiment against fires, a closer co-operation between private, state and national agencies has done much to reduce the number of fires that start in dry times and still more to prevent the fires that do occur from destroying large areas of valuable timber.

Especially energetic measures were undertaken during the past season by some of the state authorities. In August the Governor of Oregon placed detachments of troops throughout the state where trouble prevailed and incendiary fires stopped at once. The Governor also closed the hunting season after it had been open for a week. In the State of Washington the forest fire wardens controlled bad fires at the expense of those responsible for their origin and this provision of the Washington law has been commended by authorities in other states.

During the past season 650 forest patrolmen, together with the necessary extra help, extinguished 2,388 fires on the holdings of the members of the Western Forestry and Conservation Association. The season was one of the dryest on record and most favorable for the origin and spread of destructive fires. Yet the actual loss of timber this last year was very much less than in previous bad years due to the increasing effectiveness of fire-prevention measures carried out by the timberland owners whose patrolmen kept watch over an area totaling 21,326,000 acres. The timber landowners of this territory spent $290,000 for fire prevention work.

NOTIFICATION has been given by the United States Shipping Board that Southern pine manufacturers will be called on by the government to furnish during the next 12 months timbers for the construction of 100 more wooden ships, in addition to the 144 schedules which had already been placed with mills. This means approximately half a billion feet of timbers will have to be produced for the government in the Southern pine territory within a year. Four hundred million feet will go into ships, and one hundred million feet will be needed for ways, docks, props, houses and other uses at shipbuilding sites.

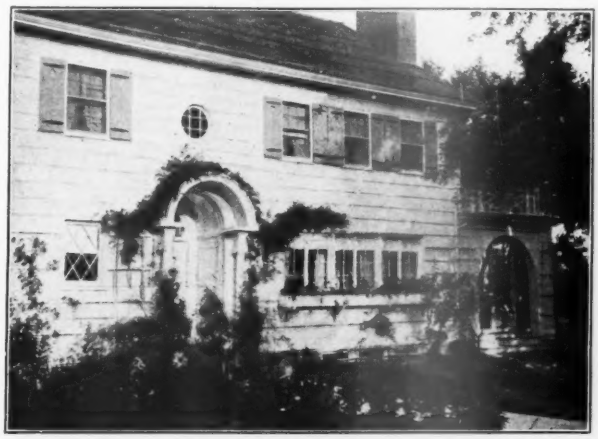
BIRDS and Food Conservation are the subject of a war bulletin issued by the Conservation Department of the General Federation of Women's Clubs, of which Mrs. John Dickinson Sherman, of Chicago, is chairman. This leaflet urges the protection of birds because of their value as destroyers of insects. Startling figures are cited, showing that in Massachusetts alone the authorities estimate one day's work by the birds to be the destruction of 21,000 bushels of insects, while in Nebraska it is estimated that the destruction amounts to 170 car loads a day. In the leaflet club women are urged to do their share in protecting the birds, by seeing that the laws are enforced.

HOW A SUCCESSFUL SUBURBAN HOUSE IS BUILT

BY RAWSON W. HADDON

WHEN we see a thoroughly successful house—one that seems well designed and conveniently planned—we are apt to be so much interested in the external successes that we give little or no attention or consideration to the less prominent details of construction which made very largely for the general success of the work.

In our admiration of the structure we, as mere spectators, are apt to think far more of how well proportioned a room is, or how convenient the stairs, than of how carefully the building materials have been chosen to assure durability and consistency with the general design of the house.



View of the DeVries home. B. E. Muller architect. Red roses will eventually be grown over the lattice in a solid mass to the top of the first story windows.

Of course, good design and substantial construction are of quite equal importance to the home builder, and in the extreme case, a slightly less well designed but carefully built house would be preferable to one that is well designed but not substantially constructed.

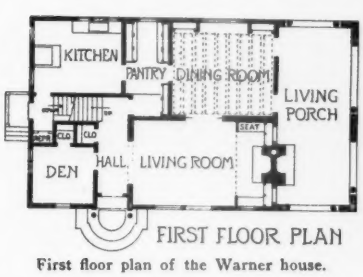
And structure must be as carefully considered by the architect as must the design, and a thorough knowledge of the comparative merits of various available materials is as essential to his success as a thorough knowledge of the rules and theories of architectural design.

When you build your house you will do well, in selecting an architect, to choose a man whose horror of flimsy beams and undersized or poorly selected studs is as great as his dislike for houses in which one must go through one bedroom to get to another, or other equally uncomfortable errors in design.

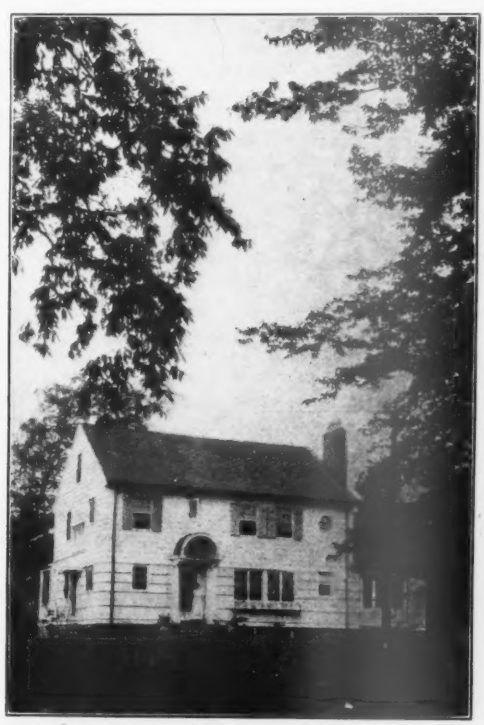
In the American house of today—just as in the American house for the last two hundred and fifty-odd years—wood is the most generally used and most successful building material. But the earlier builders used only that material nearest at hand, which they could cut down within hauling distance of the building site or that which they could buy in their immediate neighborhood while we, today, not only have greater facilities for transporting material to fit our requirements of design and exposure or expense, but we also know more about the comparative durability of various sorts of wood and their adaptability to various purposes.

The successful architect does not use haphazard methods in choosing his materials and each piece of lumber that goes into the building is used because experience has shown the architect that the material chosen is the best fitted to stand all the conditions imposed upon it in the part of the building where it is found.

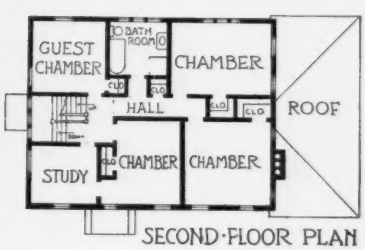
For this reason it seldom happens that any single kind of wood is used throughout the house, and instead of being a white pine or cedar house, many woods will be used, each in the place where it will give the best results, and your house will have



First floor plan of the Warner house.



View of the Warner house. Bernard E. Muller architect.



Second floor plan of the Warner house.

in various parts of it pine, spruce, cedar, oak, cypress, birch, maple and perhaps other woods.

The architect's duty, then, is to know just where and how each piece of wood is to be used and where each will give the greatest wear, where it is best fitted as a medium for carrying out the design (as white pine for delicate curving or mouldings) and what can be used to insure the least yearly expense in upkeep and repair.

A good example of successful design coupled with good construction is found in the William R. DeVries house, designed by Mr. Bernhardt E. Muller, of New York City.

In its exterior design and in its plan, the house is extremely interesting. While built along Colonial lines the design is not so strictly Colonial as to be oppressing in its imitation of the original type but is simply a free, modernized and, as one may say, humanized design following old lines. The triple casement window, for instance, is decidedly non-colonial, but it indicates to us the presence of a bright, open and airy living room and the three windows above this seem to suggest that the owner's bedroom in back of them and that it, too, is a cheerful and airy room.

The entrance porch is nearer the original style, however, and it is interesting to note how much is gained in general softness and interest in the design by the use of generous planting around the house as shown in the photograph of present conditions as compared with those before the plants had grown.

The DeVries house cost to build about $15,000. In plan it is practically the same as the Warner house, designed by the same architect and also illustrated here.

At an earlier period of architectural practice in America the house would have been built of the same material throughout.

At present the knowledge and selection of wood is an important part of architectural education. And it is of equal interest—though the knowledge is not of such extreme importance—to the person who is building or eventually will build a home of his own. And it might be said parenthetically that this latter class includes, or should include, every man and woman in America.

In addition to being an example of good suburban house planning the DeVries house is of interest because of the fact that it illustrates the results of careful study made by the architect of the sorts of wood best fitted for every detail of the house.

In this study some conclusion may have been reached which will not be generally accepted without differences of opinion here and there. And it must be recognized that various considerations such as conditions of climate and exposure and the supply found in local markets will cause changes to be made in many instances. But the results are as a rule those accepted in general practice. They show us if nothing more, at least how many details the architect must consider in the building of a house.

As a result of his study of lumber, Mr. Muller has found it advisable to call, in his specifications, for not simply one or two, but for at least ten different varieties of wood to go into the construction of this particular house.

White pine he considered the most satisfactory and least expensive material for the exposed exterior detail. This includes window sills, casings and sash, the cornice, the entrance door and porch as well as the main porch and the entire cornice. The exterior walls and roof are shingled with white cedar shingles, those on the wall are twenty inches long and twelve inches to the weather, while the roof shingles are sixteen inches long and are exposed four and one-half inches to their length.

The entire framing, including the joists, headers, studs, beams, roof rafters, sheathing and also the rough (or under) flooring is of spruce.

Finished floors differ in various parts of the house. In the main rooms they are oak. The kitchen and pantry floors are maple, while the rooms on the second and third floors and the porch floors are North Carolina pine.

How carefully the subject must be gone into is demonstrated in the cast of the windows where such fine distinctions are made in specifying as that while the sills, casing and sash which must meet extreme exposure are to be of "clear, sound, well-seasoned white pine" the jambs and parting strips are to be of "comb grained southern yellow pine well-seasoned and free from pitch and other imperfections."

In his study of structural wood the architect soon finds that conditions vary quite sharply in many important respects in different parts of the country. Most important of these, perhaps, for present consideration, is the kind and quality of lumber grown in the immediate section of the country in which the house is to be built.

In the instance of the present design it will be seen that important variations would be necessary from Mr. Muller's specification to meet climatic considerations and to obtain the best materials available in the local markets at the least cost, if it had been built in California, or in the Lake States, for instance. For building in the New England states the arrangement of structural woods as specified by the architect would be most satisfactory and economical in all respects. It is not suggested as a general specification, however, and would hardly apply in other sections of the country.

As an example of the importance this knowledge on the part of the architect, it will be noted that while North Carolina pine is specified in this house for the floors only, by referring back to the article on Building Bungalows which appeared in the April 1917 number of the magazine, it will be remembered that in the case of the two bungalows at Southern Pines, N. C., designed by Mr. Aymar Embury, of New York city, North Carolina pine was used throughout for the reason that it was the best and most economical material for use in the location in which the houses were built.

For the present house, it will be seen that if the place of erection were the Middle West, the use of spruce for the framing, studding, rafters, etc., would call for a material which is not usually carried by dealers outside of the New England market. By substituting southern yellow pine,

An attractive vista, giving a suggestion of the harmony of architectural and landscape treatment of the DeVries home.

Doorway of the DeVries house, showing the perfect lines of the portal and the simple effectiveness of the growing plants.

North Carolina pine or hemlock for the spruce, according to what kind happened to be most available and cheapest in the local market, equally satisfactory results would be obtained.

For the roof and siding it would, of course, be found desirable to substitute red cedar or cypress for the white cedar shingles in some localities, and they would serve the purpose equally well.

When you build, the architect you employ may not agree with this specification in all its details and if he does not the difference of opinion will probably be caused by some substantial consideration, but under most conditions the following list taken from the De Vries house specification will assist you in securing the most satisfactory materials for even the parts of the house of seemingly small importance:

Framing — Spruce, including lathing, joints, headers, studs, roof rafters, sheathing and rough flooring.

Exterior Walls—White cedar, 20 inches long, 12 inches to the weather.

Roof—White cedar, 16 inches long, 4½ inches to the weather.

Windows—White pine sills, casings and sash; jambs comb grained southern yellow pine.

Exterior Cornice—White pine.

Porches—White pine including hood over front door.

Flower Boxes—Cypress.

Stoops—Cypress.

Exterior Doors—White pine.

Exterior door jambs—White pine.

Exterior and interior door thresholds—Quartered white oak.

Floors (under floor) — North Carolina pine.

Floors (finished) — North Carolina pine, second and third floor rooms; North Carolina pine, porches; maple, kitchen and pantry; white oak, main rooms.

Stair—Quartered white oak, main stair from first to second floor; strings, treads and risers of other stairs are hard maple.

Handrail—Main stair quarter sawed white oak; birch, cellar and attic stairs; (balusters cypress).

Interior Finish—White oak, first floor, unless one exception is made for special work; cypress, pantry and kitchen; whitewood, hall, living room and rooms on second floor.

Drainboard in Kitchen—Ash.

The selection of materials with which to build is followed by the equally important, though less generally understood, selection of mediums that will give to these materials the best possible results in good looks. This includes the selection and proper application and use of paints and stains for both interior and exterior work.

On the whole this subject is one in which the architect has a far smaller range of choice than he has in most other matters. The selection is limited to the products of a certain number of firms and these he must experiment with until at last he finds the product best fitted for the needs of the particular house and the one which experience has shown will give the best satisfaction in wear and which shows the smallest tendencies to become worn out or shabby in the course of time.

A series of articles to be printed in American Forestry in the near future will illustrate the typical well-designed house in various other sections of the country with a discussion of the most economical and satisfactory materials for use in their erection in at least as much detail as has been done in the present instance for a house in the New England states.

Dynamite For Planting Pecans.

"For several years we have used dynamite to blast our tree holes," says G. P. Gill, President New York-Georgia Pecan Company. Pecans are our specialty. We have learned from experience that these trees planted in blasted holes do much better than in spade-dug holes. It is our conclusion that a pecan tree planted in a dynamited hole will in the course of several years catch up with in growth a tree planted several years previously in a dug hole; that is, assuming that both trees are in the same kind of soil and have the same cultivation and care. I regard this as important because every pecan grower desires to get his grove into bearing as soon as possible. Nut trees are slow growers at best; anything that will hasten their growth and convert them into money makers sooner is naturally a good idea.

"There has never been any question about the advisability of blasting tree holes in very hard soil, but there has been considerable doubt expressed as to whether it pays to blast soil that is not very hard. Our soil is of the lighter type. We have found it has paid us many times over to blast."

Nurseryman Recommends Blasting.

James S. McGlennon, Florida, a nurseryman, also writes that he is frequently asked whether he recommends dynamite for making tree holes. As there seems to be so much interest in the subject, he says: "I would not think of planting a tree or shrub without blasting the soil unless it were one of the open soil types that would not need any breaking up. I feel that even a common gooseberry bush will mature enough earlier and bear enough heavier to warrant the expense if the planting is to be done in any of the hard soil types."

Attention is directed to American Forestry's list of books on Forestry, on page 703 of this issue. In this list is a comprehensive collection of titles and authors attractive to all interested in the bibliography of trees and related subjects. These and many other books may be ordered through the American Forestry Association. Prices quoted are by mail or express, prepaid.

BOOK REVIEWS

Wood and Other Organic Structural Materials, by Charles H. Snow, C. E., Sc. D. McGraw-Hill Book Company, Inc., New York. Price, $5.

Designed for engineers, architects, students of technology, teachers of manual training and those who use structural materials, this book takes for its purpose the presentation of general and physical characteristics of a group of these materials. Among those considered are woods, paints and varnishes—with their associated oils, pigments, gums and resins—glues, creosotes and India rubber. The work is comprehensive. In its subdivisions it treats of the uses of wood, the reasons for preferring wood to other materials, the value of forests and forestry, wood protection, fireproofing and preservation, and many other subjects of related character. The author is dean of the school of applied science at New York University. He has given exhaustive study to his subject and has provided a vast amount of information of value, based on the premise that practical knowledge of the properties of structural materials will greatly influence students in the works which they may design and construct.

Botany of Crop Plants, by Wilfred W. Robbins, Ph. D. P. Blakiston's Son & Co, Philadelphia. Price, $2.

This is intended as both text and reference book. Its compilation has grown out of a course of instruction extending over a number of years. Mr. Robbins is professor of botany at the Colorado Agricultural College and much of his material has been used in college freshman classes as a text from which to make assignments and as a guide and reference in the laboratory. The book is intended to give a knowledge of the botany of the common orchard, garden and field crops. In its preparation the writer had in mind non-agricultural as well as agricultural schools, because of the growing tendency to tie up botany more closely with economic interests and to draw more upon economic plants in citing examples and in choosing subjects of study in the laboratory.

Clearing and Grubbing, by Galbert P. Gillette. Clark Book Company, New York City. Price $2.50.

In this book, just from the press, will be found not only very much valuable information by an authority on a subject which has heretofore been treated, in a way, as somewhat beneath the consideration of engineers, but also a compilation of all the important facts from state and government and current periodical publications on clearing and grubbing operations. It is the only book of its kind in print. A slight conception of the importance of the subject may be had when it is remembered that of the 400,000,000 acres of farm land now under cultivation, it is conservatively esti-

mated that 50 per cent. had to be cleared and stumped before it could be cropped; and, assuming that the 200,000,000 acres of farm land in America have been cleared and grubbed at an average cost of only $10 an acre, the great economic necessity of the application of the most modern and practical methods in clearing operations will be readily seen. Mr. Gillette has met this need in his book, and has clearly and thoroughly covered the various methods and machinery employed, and embodied where ever possible most valuable cost figures, which his actual experience as an engineering contractor have made familiar to him. The merit of the book, and its value, are unquestioned.

Successful Canning and Preserving, by Ola Powell. Lippincott's Home Manuals. J. B. Lippincott Company, Philadelphia. Price, $2.00.

Of the new literature on the preservation of food products, none is more important than Miss Ola Powell's "Successful Canning and Preserving.'" Miss Powell is assistant in Home Demonstration work in the States Relations Service of the United States Department of Agriculture. In this service her skill has gained national recognition and she is regarded as one of America's foremost experts on canning and preserving meat, vegetables, and fruits. Her experience and research enable her to speak with authority and entitle her new book to a place among the classics of this branch of literature.

"Successful Canning and Preserving" has two functions in that it is suitable for use as a text book and for practical application to household needs. Miss Powell's work in the States Relations service has rendered her admirably fitted for giving full value to both of these important phases. For several years she has directed the government canning clubs in which thousands of women and girls have acquired complete training and achieved practical and concrete results. In her book she details the methods by which the finest quality of canned products have been prepared by home canners of fourteen and older. Individual examples are given of the success of the work of canning club members. One such instance shows a season's marketing record of $155.86 in profit for a girl in one of these clubs. As a family record is cited the experience of a household which during the season put up 6,500 cans and glasses of vegetables, jellies and jams of a value of $772.80. The total cost was $193.20, showing a profit of $579.60.

While dealing primarily with canning and preserving the book devotes 25 pages to drying vegetables, fruits and herbs. The subjects discussed in detail include: canning in tin, canning in glass, fruit juices, preserves, marmalades, jams and conserves, jelly making, pickling, the preservation of meats, the use of vegetables and fruits in the diet, the organization of canning clubs and the business side of home canning. No person who follows the book carefully can fail to meet with success in these various activities.

To increase its value as a text book the volume devotes considerable space to the subject of teaching canning and kindred studies. This is so explicit as to make the book an important addition to the course of high schools, normal schools and other institutions. Another feature of similar worth is a carefully prepared list of questions at the end of each chapter, from the point of view of a home economics teacher.

The book contains 372 pages, four colored plates and 164 illustrations.

Chemistry of Food and Nutrition, by Henry C. Sherman, Ph.D., Professor of Food Chemistry in Columbia University. The MacMillan Company, New York. Price $1.50.

For its purpose this book has the presentation of the chemistry and nutritive value of food in relation to the requirements of the human body. It is the outgrowth of years of experience in research work and in teaching the subject to collegiate and technical students. It is especially useful to the general reader who realizes the importance of nutrition as a factor in general health. It also embodies material that should be of value to teachers and students. The plan of the work includes brief description of the principal foodstuffs and the agencies and processes through which they become available for the uses of the body. In addition it follows the functions of these foods in the tissues and sets forth the food requirements of the body under varying conditions, the nutritive functions of chemical elements and the quantities in which they should be supplied by the food. It also details the standards by which to judge nutritive value and economy of articles of food.

Feeding the Family, by Mary Swartz Rose, Ph.D., assistant professor, department of Nutrition, Teachers' College, Columbia University. The MacMillan Company, New York. Price, $2.

Intended primarily for uses in the home, this volume undertakes to present food and diet information in such manner as will make it easily available in the midst of the cares of the household. The subject is treated clearly and concisely, in plain language, showing how the science of nutrition may be applied in daily living. The author treats of the food needs of the individual members of the average family, from infancy to old age. Various concrete illustrations of food plans and dietaries are presented, and generous heed given to the housewife's problem in reconciling the needs of different ages and tastes. Among the problems helpfully treated are the construction of daily bills of fare on a rational basis, the wise expenditure of money for food and reasonable control of the kinds of food consumed.

The book has a value for every housekeeper.

Human Foods and their Nutritive Value, by Harry Snyder, B.S., Professor of Agricultural Chemistry in the University of Minnesota. The MacMillan Company, New York. Price $1.25.

Professor Snyder, in this book, shows a clear understanding of food values and sets them forth in style well adapted for use of the work of a text-book for students in colleges. In concise form he presents the composition and physical properties of foods and discusses some of the main factors which affect their nutritive value. Combined with a presentation of the principles of human nutrition is given a study of the more common articles of food, in the belief that it will suggest ways in which foods may be selected and utilized with saving of money and increased efficiency of physical and mental effort. Especial prominence is given flour, bread, cereals, vegetables, meats, milk, dairy products and fruits as the articles most extensively used.

The Handbook of Explosives, just issued by E. I. Du Pont de Nemours & Company, gives instructions for the use of explosives for clearing land, planting and cultivating trees, draining, ditching, subsoiling and other purposes. Especial interest attaches to the information in connection with tree planting. The book shows that blasting mellows the ground to a depth of five or six feet and throughout a circular area 10 to 20 feet in diameter, making it easy to dig the hole and plant the tree correctly. In addition it creates a porous, water-absorbing condition which decreases the danger of drouth and invigorates growth. Details of processes of tree felling and stump blasting are also given. The book is filled with information on these and related subjects and is useful to all who are interested.

"Vertical Farming" is another book issued by the same concern. This deals with the use of explosives in shattering subsoils, to give greater feeding area for the roots of vegetation. This book is by Gilbert Ellis Bailey, A. M., E. M., Ph. D., professor of geology at the University of Southern California. It is freely illustrated.

CANADIAN DEPARTMENT

ELLWOOD WILSON, SECRETARY, CANADIAN SOCIETY OF FOREST ENGINEERS

The next step in forestry progress in Canada will probably be toward the better disposal of logging debris. With the advent of co-operative fire protective associations and the consequent great improvement in the forest fire situation and the greater knowledge of the causes of fires and the means for their prevention, it is being realized that could we economically and practically do away with the slash from logging operations, one of the most serious of the remaining causes of forest fires would be eliminated. A fire once started in a logging slash is practically impossible to extinguish until it reaches an unlogged section or some other barrier. The uncut forest, except in exceptionally dry seasons, does not catch fire readily and the fire, if discovered soon enough, is comparatively easy to put out. In looking over a map of the St. Maurice Valley showing the burnt areas, one sees right away that nearly all the fires have followed logging operations, showing that the debris is a great menace. Lopping the tops in our spruce and balsam operations has been proved by actual experiment to cost practically as much as brush burning, and it is only a half-way measure. Where the tops are lopped they rot sooner, but for the first year or two are almost as dangerous as unlopped tops, and fires originating in such areas are almost as difficult to extinguish. Burning the debris is perfectly feasible, even with several feet of snow on the ground, and is very easy in soft wood operations. For two winters, the Forestry Department of the Laurentide Company has been cutting hardwood and all of the debris has been burnt without difficulty. The claim that the additional cost is too great might possibly be true if only one operator burnt his brush, but if such disposal were made compulsory by law, all operators would be on the same footing, and it would be no hardship. The claim that has often been made that it is cheaper to spend more for fire protection, instead of burning brush, is plausible but fallacious. Even by putting on many more rangers, it is very difficult to keep fires out of slash, and once started, the remaining timber is almost certain to be ruined before the fire is put out. Our dependence for the future is entirely on the uncut forest and the cut-over areas, on which trees below a certain diameter limit and the young growth are left and these must be thoroughly protected. The whole subject is being carefully studied and as fast as the owners of timber lands can be brought to see the necessity of absolute fire protection some practicable law will be formulated.

It is interesting to note the increase in the price of pulpwood lands, as shown by the recent sale of timber limits in Quebec. Eight hundred and eighty square miles were sold at an average price of $140 per mile, which exceeds by $100 the largest average price previously paid. The highest price paid was $1,000 per square mile. Quite a portion of the land offered for sale was withdrawn as the minimum price was not bid. A new condition is added to the leases, "The grantees of the aforesaid territory must within a delay of three years, manufacture annually in the Province of Quebec, with the timber cut in this territory, either pulp or paper, the proportion of ten tons per day, or sawn timber in the proportion of 10,000 feet board measure a day, per hundred square miles.

Some interesting efforts are being made in Ontario to reforest sandy hills in that Province. Five thousand, four hundred trees were planted, half the area being covered afterward with cedar brush. The section so covered showed the best results, the uncovered portion had many trees either covered with the drifting sand or blown completely out by the wind.

The Dominion Government is making, for the purpose of advertising Canada, some very interesting moving-picture films of power and manufacturing plants and public works. The latest one is of the new storage dam on the head of the St. Maurice River, built by the Running Waters Commission of Quebec, which will be completed

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G. H FERGUSON,
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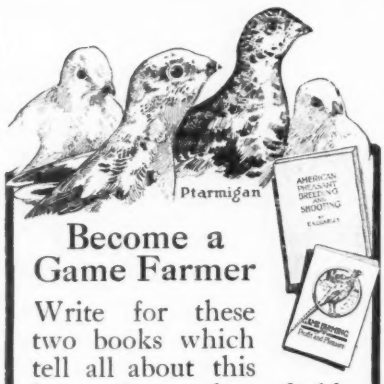

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Material progress has been made by the Ontario Forestry Branch in the organization of fire protection work on crown timber lands in that province. There are 15,712 square miles under license to cut timber, from which the Province derives a direct revenue of upwards of $1,500,000 per annum in normal times. In addition, a fire tax of $6.40 per square mile per year is imposed on license holders. This amount is largely supplemented by the Province, since the fire ranging organization covers very large areas of lands, much of which have been cut over and burned over, but contain a great deal of young forest growth. The total appropriation for all the lines of work with which the Forestry Branch is charged is in the neighborhood of $375,000. The bulk of this goes for fire protection, but provision is made also for nursery and planting work, eradication of the pine blister disease, etc.

E. J. Zavitz is Provincial Forester; J. H. White Assistant Provincial Forester and L. E. Bliss is General Superintendent of fire protection. The Province is divided into 34 districts, with a chief ranger in each district. There are 31 sub-chief rangers, and 986 rangers. For the most part, the rangers work in pairs and travel by canoe. Some are on railway patrol, while others utilize the various other methods of transportation suitable to the local conditions in each case.

Five automobile trucks, with fire-fighting equipment, have been provided for districts where roads to the settlers exist. Some 625 miles of old trails and portages have been cleared out, and 60 miles of new trails and portages constructed. Of lookout towers, 22 have been built, and 19 more are under construction. About 45 miles of telephone line has been erected.

The permit system of regulating settlers clearing fires is in effect in the clay belt of Northern Ontario, and is working well.

It will necessarily require time to get the new organization in thoroughly satisfactory running order, but the progress made thus far gives promise of continued improvement. This work was placed under the Forestry Branch only this year, and many serious obstacles have had to be overcome. The improvement already made is really notable.

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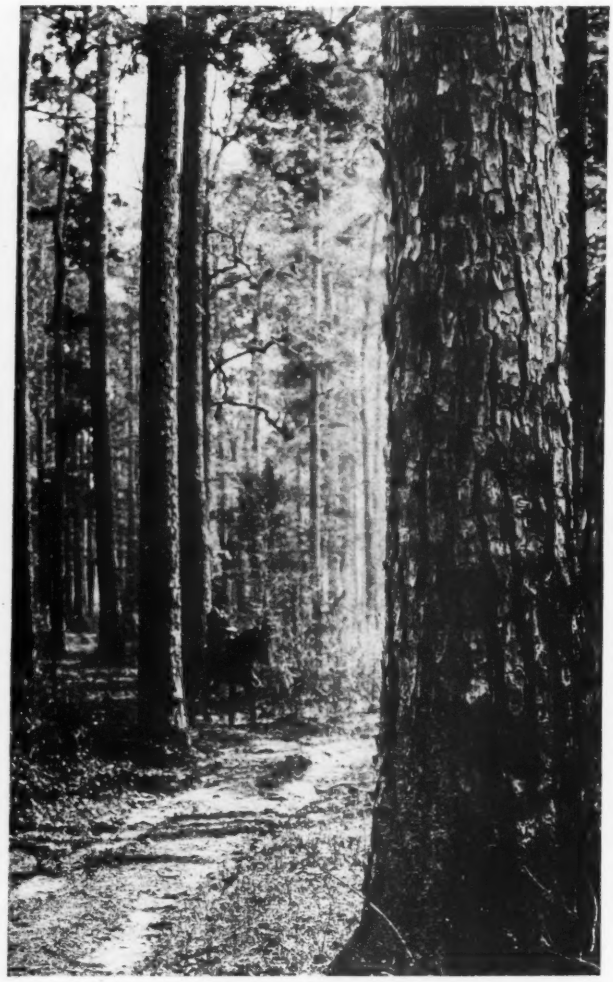

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IT ASSERTS THAT forestry means the propagation and care of forests for the production of timber as a crop; protection of watersheds; utilization of non-agricultural soil; use of forests for public recreation.

IT DECLARES THAT FORESTRY is of immense importance to the people; that the census of 1913 shows our forests annually supply over one and a quarter billion dollars' worth of products; employ 735,000 people; pay $367,000,000 in wages; cover 550,000,000 acres unsuited for agriculture; regulate the distribution of water; prevent erosion of lands; and are essential to the beauty of the country and the health of the nation.

IT RECOGNIZES THAT forestry is an industry limited by economic conditions; that private owners should be aided and encouraged by investigations, demonstrations, and educational work, since they cannot be expected to practice forestry at a financial loss; that Federal and State governments should undertake scientific forestry upon National and State forest reserves for the benefit of the public.

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